

s263US104.ST25  
SEQUENCE LISTING

<110> COMMISSARIAT A L'ENERGIE ATOMIQUE  
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<120> ION CHANNEL HYBRID PROTEINS AS ELECTRICAL SENSORS AND USE THEREOF

<130> F263US104

<160> 25

<170> PatentIn version 3.1

<210> 1  
<211> 1927  
<212> PRT  
<213> Homo sapiens

<400> 1

Met Ala Leu Arg Gly Phe Cys Ser Ala Asp Gly Ser Asp Pro Leu Trp  
1 5 10 15

Asp Trp Asn Val Thr Trp Asn Thr Ser Asn Pro Asp Phe Thr Lys Cys  
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Phe Gln Asn Thr Val Leu Val Trp Val Pro Cys Phe Tyr Leu Trp Ala  
35 40 45

Cys Phe Pro Phe Tyr Phe Leu Tyr Leu Ser Arg His Asp Arg Gly Tyr  
50 55 60

Ile Gln Met Thr Pro Leu Asn Lys Thr Lys Thr Ala Leu Gly Phe Leu  
65 70 75 80

Leu Trp Ile Val Cys Trp Ala Asp Leu Phe Tyr Ser Phe Trp Glu Arg  
85 90 95

Ser Arg Gly Ile Phe Leu Ala Pro Val Phe Leu Val Ser Pro Thr Leu  
100 105 110

Leu Gly Ile Thr Thr Leu Leu Ala Thr Phe Leu Ile Gln Leu Glu Arg  
115 120 125

Arg Lys Gly Val Gln Ser Ser Gly Ile Met Leu Thr Phe Trp Leu Val  
130 135 140

Ala Leu Val Cys Ala Leu Ala Ile Leu Arg Ser Lys Ile Met Thr Ala  
145 150 155 160

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Leu Lys Glu Asp Ala Gln Val Asp Leu Phe Arg Asp Ile Thr Phe Tyr  
 165 170 175  
 Val Tyr Phe Ser Leu Leu Leu Ile Gln Leu Val Leu Ser Cys Phe Ser  
 180 185 190  
 Asp Arg Ser Pro Leu Phe Ser Glu Thr Ile His Asp Pro Asn Pro Cys  
 195 200 205  
 Pro Glu Ser Ser Ala Ser Phe Leu Ser Arg Ile Thr Phe Trp Trp Ile  
 210 215 220  
 Thr Gly Leu Ile Val Arg Gly Tyr Arg Gln Pro Leu Glu Gly Ser Asp  
 225 230 235 240  
 Leu Trp Ser Leu Asn Lys Glu Asp Thr Ser Glu Gln Val Val Pro Val  
 245 250 255  
 Leu Val Lys Asn Trp Lys Lys Glu Cys Ala Lys Thr Arg Lys Gln Pro  
 260 265 270  
 Val Lys Val Val Tyr Ser Ser Lys Asp Pro Ala Gln Pro Lys Glu Ser  
 275 280 285  
 Ser Lys Val Asp Ala Asn Glu Glu Val Glu Ala Leu Ile Val Lys Ser  
 290 295 300  
 Pro Gln Lys Glu Trp Asn Pro Ser Leu Phe Lys Val Leu Tyr Lys Thr  
 305 310 315 320  
 Phe Gly Pro Tyr Phe Leu Met Ser Phe Phe Phe Lys Ala Ile His Asp  
 325 330 335  
 Leu Met Met Phe Ser Gly Pro Gln Ile Leu Lys Leu Leu Ile Lys Phe  
 340 345 350  
 Val Asn Asp Thr Lys Ala Pro Asp Trp Gln Gly Tyr Phe Tyr Thr Val  
 355 360 365  
 Leu Leu Phe Val Thr Ala Cys Leu Gln Thr Leu Val Leu His Gln Tyr  
 370 375 380  
 Phe His Ile Cys Phe Val Ser Gly Met Arg Ile Lys Thr Ala Val Ile  
 385 390 395 400  
 Gly Ala Val Tyr Arg Lys Ala Leu Val Ile Thr Asn Ser Ala Arg Lys  
 405 410 415

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Ser Ser Thr Val<sub>420</sub> Gly Glu Ile Val Asn<sub>425</sub> Leu Met Ser Val Asp<sub>430</sub> Ala Gln  
 Arg Phe Met<sub>435</sub> Asp Leu Ala Thr Tyr<sub>440</sub> Ile Asn Met Ile Trp<sub>445</sub> Ser Ala Pro  
 Leu Gln Val<sub>450</sub> Ile Leu Ala Leu<sub>455</sub> Tyr Leu Leu Trp<sub>460</sub> Leu Asn Leu Gly Pro  
 Ser Val<sub>465</sub> Leu Ala Gly Val<sub>470</sub> Ala Val Met Val<sub>475</sub> Leu Met Val Pro Val<sub>480</sub> Asn  
 Ala Val Met Ala Met<sub>485</sub> Lys Thr Lys Thr Tyr<sub>490</sub> Gln Val Ala His Met<sub>495</sub> Lys  
 Ser Lys Asp<sub>500</sub> Asn Arg Ile Lys Leu Met<sub>505</sub> Asn Glu Ile Leu Asn<sub>510</sub> Gly Ile  
 Lys Val<sub>515</sub> Leu Lys Leu Tyr Ala Trp<sub>520</sub> Glu Leu Ala Phe Lys<sub>525</sub> Asp Lys Val  
 Leu Ala<sub>530</sub> Ile Arg Gln Glu Glu<sub>535</sub> Leu Lys Val Leu Lys<sub>540</sub> Lys Ser Ala Tyr  
 Leu<sub>545</sub> Ser Ala Val Gly Thr<sub>550</sub> Phe Thr Trp Val Cys<sub>555</sub> Thr Pro Phe Leu Val<sub>560</sub>  
 Ala Leu Cys Thr Phe<sub>565</sub> Ala Val Tyr Val Thr<sub>570</sub> Ile Asp Glu Asn Asn<sub>575</sub> Ile  
 Leu Asp Ala Gln Thr Ala Phe Val Ser<sub>585</sub> Leu Ala Leu Phe Asn<sub>590</sub> Ile Leu  
 Arg Phe Pro<sub>595</sub> Leu Asn Ile Leu Pro Met Val Ile Ser Ser<sub>605</sub> Ile Val Gln  
 Ala Ser Val Ser Leu Lys Arg<sub>615</sub> Leu Arg Ile Phe Leu Ser His Glu Glu  
 Leu<sub>625</sub> Glu Pro Asp Ser Ile<sub>630</sub> Glu Arg Arg Pro Val<sub>635</sub> Lys Asp Gly Gly<sub>640</sub>  
 Thr Asn Ser Ile Thr<sub>645</sub> Val Arg Asn Ala Thr<sub>650</sub> Phe Thr Trp Ala Arg Ser<sub>655</sub>  
 Asp Pro Pro Thr Leu Asn Gly Ile Thr Phe Ser Ile Pro Glu Gly Ala

660

665

670

Leu Val Ala Val Val Gly Gln Val Gly Cys Gly Lys Ser Ser Leu Ile  
675 680

Ser Ala Leu Leu Ala Glu Met Asp Lys Val Glu Gly His Val Ala Ile  
690 695 700

Lys Gly Ser Val Ala Tyr Val Pro Gln Gln Ala Trp Ile Gln Asn Asp  
705 710 715

Ser Leu Arg Glu Asn Ile Leu Phe Gly Cys Gln Leu Glu Glu Pro Tyr  
725 730 735

Tyr Arg Ser Val Ile Gln Ala Cys Ala Leu Leu Pro Asp Leu Glu Ile  
740 745 750

Leu Pro Ser Gly Asp Arg Thr Glu Ile Gly Glu Lys Gly Val Asn Leu  
755 760 765

Ser Gly Gly Gln Lys Gln Arg Val Ser Leu Ala Arg Ala Val Tyr Ser  
770 775 780

Asn Ala Asp Ile Tyr Leu Phe Asp Asp Pro Leu Ser Ala Val Asp Ala  
785 790 795 800

His Val Gly Lys His Ile Phe Glu Asn Val Ile Gly Pro Lys Gly Met  
805 810 815

Leu Lys Asn Lys Thr Arg Ile Leu Val Thr His Ser Met Ser Tyr Leu  
820 825 830

Pro Gln Val Asp Val Ile Ile Val Met Ser Gly Gly Lys Ile Ser Glu  
835 840 845

Met Gly Ser Tyr Gln Glu Leu Leu Ala Arg Asp Gly Ala Phe Ala Glu  
850 855 860

Phe Leu Arg Thr Tyr Ala Ser Thr Glu Gln Glu Gln Asp Ala Glu Glu  
865 870 875 880

Asn Gly Val Thr Gly Val Ser Gly Pro Gly Lys Glu Ala Lys Gln Met  
885 890 895

Glu Asn Gly Met Leu Val Thr Asp Ser Ala Gly Lys Gln Leu Gln Arg  
900 905 910

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Gln Leu Ser Ser Ser Ser Ser Tyr Ser Gly Asp Ile Ser Arg His His  
915 920 925

Asn Ser Thr Ala Glu Leu Gln Lys Ala Glu Ala Lys Lys Glu Glu Thr  
930 935 940

Trp Lys Leu Met Glu Ala Asp Lys Ala Gln Thr Gly Gln Val Lys Leu  
945 950 955 960

Ser Val Tyr Trp Asp Tyr Met Lys Ala Ile Gly Leu Phe Ile Ser Phe  
965 970 975

Leu Ser Ile Phe Leu Phe Met Cys Asn His Val Ser Ala Leu Ala Ser  
980 985 990

Asn Tyr Trp Leu Ser Leu Trp Thr Asp Asp Pro Ile Val Asn Gly Thr  
995 1000 1005

Gln Glu His Thr Lys Val Arg Leu Ser Val Tyr Gly Ala Leu Gly  
1010 1015 1020

Ile Ser Gln Gly Ile Ala Val Phe Gly Tyr Ser Met Ala Val Ser  
1025 1030 1035

Ile Gly Gly Ile Leu Ala Ser Arg Cys Leu His Val Asp Leu Leu  
1040 1045 1050

His Ser Ile Leu Arg Ser Pro Met Ser Phe Phe Glu Arg Thr Pro  
1055 1060 1065

Ser Gly Asn Leu Val Asn Arg Phe Ser Lys Glu Leu Asp Thr Val  
1070 1075 1080

Asp Ser Met Ile Pro Glu Val Ile Lys Met Phe Met Gly Ser Leu  
1085 1090 1095

Phe Asn Val Ile Gly Ala Cys Ile Val Ile Leu Leu Ala Thr Pro  
1100 1105 1110

Ile Ala Ala Ile Ile Ile Pro Pro Leu Gly Leu Ile Tyr Phe Phe  
1115 1120 1125

Val Gln Arg Phe Tyr Val Ala Ser Ser Arg Gln Leu Lys Arg Leu  
1130 1135 1140

Glu Ser Val Ser Arg Ser Pro Val Tyr Ser His Phe Asn Glu Thr  
1145 1150 1155

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Leu Leu Gly Val Ser Val Ile Arg Ala Phe Glu Glu Gln Glu Arg  
 1160 1165 1170  
 Phe Ile His Gln Ser Asp Leu Lys Val Asp Glu Asn Gln Lys Ala  
 1175 1180 1185  
 Tyr Tyr Pro Ser Ile Val Ala Asn Arg Trp Leu Ala Val Arg Leu  
 1190 1195 1200  
 Glu Cys Val Gly Asn Cys Ile Val Leu Phe Ala Ala Leu Phe Ala  
 1205 1210 1215  
 Val Ile Ser Arg His Ser Leu Ser Ala Gly Leu Val Gly Leu Ser  
 1220 1225 1230  
 Val Ser Tyr Ser Leu Gln Val Thr Thr Tyr Leu Asn Trp Leu Val  
 1235 1240 1245  
 Arg Met Ser Ser Glu Met Glu Thr Asn Ile Val Ala Val Glu Arg  
 1250 1255 1260  
 Leu Lys Glu Tyr Ser Glu Thr Glu Lys Glu Ala Pro Trp Gln Ile  
 1265 1270 1275  
 Gln Glu Thr Ala Pro Pro Ser Ser Trp Pro Gln Val Gly Arg Val  
 1280 1285 1290  
 Glu Phe Arg Asn Tyr Cys Leu Arg Tyr Arg Glu Asp Leu Asp Phe  
 1295 1300 1305  
 Val Leu Arg His Ile Asn Val Thr Ile Asn Gly Gly Glu Lys Val  
 1310 1315 1320  
 Gly Ile Val Gly Arg Thr Gly Ala Gly Lys Ser Ser Leu Thr Leu  
 1325 1330 1335  
 Gly Leu Phe Arg Ile Asn Glu Ser Ala Glu Gly Glu Ile Ile Ile  
 1340 1345 1350  
 Asp Gly Ile Asn Ile Ala Lys Ile Gly Leu His Asp Leu Arg Phe  
 1355 1360 1365  
 Lys Ile Thr Ile Ile Pro Gln Asp Pro Val Leu Phe Ser Gly Ser  
 1370 1375 1380  
 Leu Arg Met Asn Leu Asp Pro Phe Ser Gln Tyr Ser Asp Glu Glu  
 1385 1390 1395

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Val Trp Thr Ser Leu Glu Leu Ala His Leu Lys Asp Phe Val Ser  
1400 1405 1410

Ala Leu Pro Asp Lys Leu Asp His Glu Cys Ala Glu Gly Gly Glu  
1415 1420 1425

Asn Leu Ser Val Gly Gln Arg Gln Leu Val Cys Leu Ala Arg Ala  
1430 1435 1440

Leu Leu Arg Lys Thr Lys Ile Leu Val Leu Asp Glu Ala Thr Ala  
1445 1450 1455

Ala Val Asp Leu Glu Thr Asp Asp Leu Ile Gln Ser Thr Ile Arg  
1460 1465 1470

Thr Gln Phe Glu Asp Cys Thr Val Leu Thr Ile Ala His Arg Leu  
1475 1480 1485

Asn Thr Ile Met Asp Tyr Thr Arg Val Ile Val Leu Asp Lys Gly  
1490 1495 1500

Glu Ile Gln Glu Tyr Gly Ala Pro Ser Asp Leu Leu Gln Gln Arg  
1505 1510 1515

Gly Leu Phe Tyr Ser Met Ala Lys Asp Ala Gly Leu Val Gly Gly  
1520 1525 1530

Gly Gly Gly Gly Met Leu Ser Arg Lys Gly Ile Ile Pro Glu Glu  
1535 1540 1545

Tyr Val Leu Thr Arg Leu Ala Glu Asp Pro Ala Glu Pro Arg Tyr  
1550 1555 1560

Arg Thr Arg Glu Arg Arg Ala Arg Phe Val Ser Lys Lys Gly Asn  
1565 1570 1575

Cys Asn Val Ala His Lys Asn Ile Arg Glu Gln Gly Arg Phe Leu  
1580 1585 1590

Gln Asp Val Phe Thr Thr Leu Val Asp Leu Lys Trp Pro His Thr  
1595 1600 1605

Leu Leu Ile Phe Thr Met Ser Phe Leu Cys Ser Trp Leu Leu Phe  
1610 1615 1620

Ala Met Val Trp Trp Leu Ile Ala Phe Ala His Gly Asp Leu Ala

1625					1630					s263US104.ST25 1635				
Pro Gly 1640	Glu Gly	Thr Asn	Val 1645	Pro Cys	Val Thr	Ser 1650	Ile His	Ser						
Phe Ser 1655	Ser Ala	Phe Leu	Phe 1660	Ser Ile	Glu Val	Gln 1665	Val Thr	Ile						
Gly Phe 1670	Gly Gly	Arg Met	Val 1675	Thr Glu	Glu Cys	Pro 1680	Leu Ala	Ile						
Leu Ile 1685	Leu Ile	Val Gln	Asn 1690	Ile Val	Gly Leu	Met 1695	Ile Asn	Ala						
Ile Met 1700	Leu Gly	Cys Ile	Phe 1705	Met Lys	Thr Ala	Gln 1710	Ala His	Arg						
Arg Ala 1715	Glu Thr	Leu Ile	Phe 1720	Ser Lys	His Ala	Val 1725	Ile Thr	Leu						
Arg His 1730	Gly Arg	Leu Cys	Phe 1735	Met Leu	Arg Val	Gly 1740	Asp Leu	Arg						
Lys Ser 1745	Met Ile	Ile Ser	Ala 1750	Thr Ile	His Met	Gln 1755	Val Val	Arg						
Lys Thr 1760	Thr Ser	Pro Glu	Gly 1765	Glu Val	Val Pro	Leu 1770	His Gln	Val						
Asp Ile 1775	Pro Met	Glu Asn	Gly 1780	Val Gly	Gly Asn	Gly 1785	Ile Phe	Leu						
Val Ala 1790	Pro Leu	Ile Ile	Tyr 1795	His Val	Ile Asp	Ser 1800	Asn Ser	Pro						
Leu Tyr 1805	Asp Leu	Ala Pro	Ser 1810	Asp Leu	His His	His 1815	Gln Asp	Leu						
Glu Ile 1820	Ile Val	Ile Leu	Glu 1825	Gly Val	Val Glu	Thr 1830	Thr Gly	Ile						
Thr Thr 1835	Gln Ala	Arg Thr	Ser 1840	Tyr Leu	Ala Asp	Glu 1845	Ile Leu	Trp						
Gly Gln 1850	Arg Phe	Val Pro	Ile 1855	Val Ala	Glu Glu	Asp 1860	Gly Arg	Tyr						



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Ser Val Asp Tyr Ser Lys Phe Gly Asn Thr Ile Lys Val Pro Thr  
 1865 1870 1875

Pro Leu Cys Thr Ala Arg Gln Leu Asp Glu Asp Arg Ser Leu Leu  
 1880 1885 1890

Asp Ala Leu Thr Leu Ala Ser Ser Arg Gly Pro Leu Arg Lys Arg  
 1895 1900 1905

Ser Val Ala Val Ala Lys Ala Lys Pro Lys Phe Ser Ile Ser Pro  
 1910 1915 1920

Asp Ser Leu Ser  
 1925

<210> 2  
 <211> 1911  
 <212> PRT  
 <213> Saccharomyces cerevisiae

<400> 2

Met Ala Gly Asn Leu Val Ser Trp Ala Cys Lys Leu Cys Arg Ser Pro  
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Glu Gly Phe Gly Pro Ile Ser Phe Tyr Gly Asp Phe Thr Gln Cys Phe  
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Ile Asp Gly Val Ile Leu Asn Leu Ser Ala Ile Phe Met Ile Thr Phe  
 35 40 45

Gly Ile Arg Asp Leu Val Asn Leu Cys Lys Lys Lys His Ser Gly Ile  
 50 55 60

Lys Tyr Arg Arg Asn Trp Ile Ile Val Ser Arg Met Ala Leu Val Leu  
 65 70 75 80

Leu Glu Ile Ala Phe Val Ser Leu Ala Ser Leu Asn Ile Ser Lys Glu  
 85 90 95

Glu Ala Glu Asn Phe Thr Ile Val Ser Gln Tyr Ala Ser Thr Met Leu  
 100 105 110

Ser Leu Phe Val Ala Leu Ala Leu His Trp Ile Glu Tyr Asp Arg Ser  
 115 120 125

Val Val Ala Asn Thr Val Leu Leu Phe Tyr Trp Leu Phe Glu Thr Phe  
 130 135 140

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Gly Asn Phe Ala Lys Leu Ile Asn Ile Leu Ile Arg His Thr Tyr Glu  
 145 150 155 160

Gly Ile Trp Tyr Ser Gly Gln Thr Gly Phe Ile Leu Thr Leu Phe Gln  
 165 170 175

Val Ile Thr Cys Ala Ser Ile Leu Leu Leu Glu Ala Leu Pro Lys Lys  
 180 185 190

Pro Leu Met Pro His Gln His Ile His Gln Thr Leu Thr Arg Arg Lys  
 195 200 205

Pro Asn Pro Tyr Asp Ser Ala Asn Ile Phe Ser Arg Ile Thr Phe Ser  
 210 215 220

Trp Met Ser Gly Leu Met Lys Thr Gly Tyr Glu Lys Tyr Leu Val Glu  
 225 230 235

Ala Asp Leu Tyr Lys Leu Pro Arg Asn Phe Ser Ser Glu Glu Leu Ser  
 245 250 255

Gln Lys Leu Glu Lys Asn Trp Glu Asn Glu Leu Lys Gln Lys Ser Asn  
 260 265 270

Pro Ser Leu Ser Trp Ala Ile Cys Arg Thr Phe Gly Ser Lys Met Leu  
 275 280 285

Leu Ala Ala Phe Phe Lys Ala Ile His Asp Val Leu Ala Phe Thr Gln  
 290 295 300

Pro Gln Leu Leu Arg Ile Leu Ile Lys Phe Val Thr Asp Tyr Asn Ser  
 305 310 315 320

Glu Arg Gln Asp Asp His Ser Ser Leu Gln Gly Phe Glu Asn Asn His  
 325 330 335

Pro Gln Lys Leu Pro Ile Val Arg Gly Phe Leu Ile Ala Phe Ala Met  
 340 345 350

Phe Leu Val Gly Phe Thr Gln Thr Ser Val Leu His Gln Tyr Phe Leu  
 355 360 365

Asn Val Phe Asn Thr Gly Met Tyr Ile Lys Ser Ala Leu Thr Ala Leu  
 370 375 380

Ile Tyr Gln Lys Ser Leu Val Leu Ser Asn Glu Ala Ser Gly Leu Ser  
 385 390 395 400

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Ser Thr Gly Asp Ile Val Asn Leu Met Ser Val Asp Val Gln Lys Leu  
405 410 415

Gln Asp Leu Thr Gln Trp Leu Asn Leu Ile Trp Ser Gly Pro Phe Gln  
420 425 430

Ile Ile Ile Cys Leu Tyr Ser Leu Tyr Lys Leu Leu Gly Asn Ser Met  
435 440 445

Trp Val Gly Val Ile Ile Leu Val Ile Met Met Pro Leu Asn Ser Phe  
450 455 460

Leu Met Arg Ile Gln Lys Lys Leu Gln Lys Ser Gln Met Lys Tyr Lys  
465 470 475 480

Asp Glu Arg Thr Arg Val Ile Ser Glu Ile Leu Asn Asn Ile Lys Ser  
485 490 495

Leu Lys Leu Tyr Ala Trp Glu Lys Pro Tyr Arg Glu Lys Leu Glu Glu  
500 505 510

Val Arg Asn Asn Lys Glu Leu Lys Asn Leu Thr Lys Leu Gly Cys Tyr  
515 520 525

Met Ala Val Thr Ser Phe Gln Phe Asn Ile Val Pro Phe Leu Val Ser  
530 535 540

Cys Cys Thr Phe Ala Val Phe Val Tyr Thr Glu Asp Arg Ala Leu Thr  
545 550 555 560

Thr Asp Leu Val Phe Pro Ala Leu Thr Leu Phe Asn Leu Leu Ser Phe  
565 570 575

Pro Leu Met Ile Ile Pro Met Val Leu Asn Ser Phe Ile Glu Ala Ser  
580 585 590

Val Ser Ile Gly Arg Leu Phe Thr Phe Phe Thr Asn Glu Glu Leu Gln  
595 600 605

Pro Asp Ser Val Gln Arg Leu Pro Lys Val Lys Asn Ile Gly Asp Val  
610 615 620

Ala Ile Asn Ile Gly Asp Asp Ala Thr Phe Leu Trp Gln Arg Lys Pro  
625 630 635 640

Glu Tyr Lys Val Ala Leu Lys Asn Ile Asn Phe Gln Ala Lys Lys  
645 650 655

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Asn Leu Thr Cys Ile Val Gly Lys Val Gly Ser Gly Lys Thr Ala Leu  
 660 665 670  
 Leu Ser Cys Met Leu Gly Asp Arg Phe Arg Val Lys Gly Phe Ala Thr  
 675 680 685  
 Val His Gly Ser Val Ala Tyr Val Ser Gln Val Pro Trp Ile Met Asn  
 690 695 700  
 Gly Thr Val Lys Glu Asn Ile Leu Phe Gly His Arg Tyr Asp Ala Glu  
 705 710 715 720  
 Phe Tyr Glu Lys Thr Ile Lys Ala Cys Ala Leu Thr Ile Asp Leu Ala  
 725 730 735  
 Ile Leu Met Asp Gly Asp Lys Thr Leu Val Gly Glu Lys Gly Ile Ser  
 740 745 750  
 Leu Ser Gly Gly Gln Lys Ala Arg Leu Ser Leu Ala Arg Ala Val Tyr  
 755 760 765  
 Ala Arg Ala Asp Thr Tyr Leu Leu Asp Asp Pro Leu Ala Ala Val Asp  
 770 775 780  
 Glu His Val Ala Arg His Leu Ile Glu His Val Leu Gly Pro Asn Gly  
 785 790 795 800  
 Leu Leu His Thr Lys Thr Lys Val Leu Ala Thr Asn Lys Val Ser Ala  
 805 810 815  
 Leu Ser Ile Ala Asp Ser Ile Ala Leu Leu Asp Asn Gly Glu Ile Thr  
 820 825 830  
 Gln Gln Gly Thr Tyr Asp Glu Ile Thr Lys Asp Ala Asp Ser Pro Leu  
 835 840 845  
 Trp Lys Leu Leu Asn Asn Tyr Gly Lys Lys Asn Asn Gly Lys Ser Asn  
 850 855 860  
 Glu Phe Gly Asp Ser Ser Glu Ser Ser Val Arg Glu Ser Ser Ile Pro  
 865 870 875 880  
 Val Glu Gly Glu Leu Glu Gln Leu Gln Lys Leu Asn Asp Leu Asp Phe  
 885 890 895  
 Gly Asn Ser Asp Ala Ile Ser Leu Arg Arg Ala Ser Asp Ala Thr Leu

900

905

910

Gly Ser Ile Asp Phe Gly Asp Asp Glu Asn Ile Ala Lys Arg Glu His  
 915 920 925  
 Arg Glu Gln Gly Lys Val Lys Trp Asn Ile Tyr Leu Glu Tyr Ala Lys  
 930 935 940  
 Ala Cys Asn Pro Lys Ser Val Cys Val Phe Ile Leu Phe Ile Val Ile  
 945 950 955 960  
 Ser Met Phe Leu Ser Val Met Gly Asn Val Trp Leu Lys His Trp Ser  
 965 970 975  
 Glu Val Asn Ser Arg Tyr Gly Ser Asn Pro Asn Ala Ala Arg Tyr Leu  
 980 985 990  
 Ala Ile Tyr Phe Ala Leu Gly Ile Gly Ser Ala Leu Ala Thr Leu Ile  
 995 1000 1005  
 Gln Thr Ile Val Leu Trp Val Phe Cys Thr Ile His Ala Ser Lys  
 1010 1015 1020  
 Tyr Leu His Asn Leu Met Thr Asn Ser Val Leu Arg Ala Pro Met  
 1025 1030 1035  
 Thr Phe Phe Glu Thr Thr Pro Ile Gly Arg Ile Leu Asn Arg Phe  
 1040 1045 1050  
 Ser Asn Asp Ile Tyr Lys Val Asp Ala Leu Leu Gly Arg Thr Phe  
 1055 1060 1065  
 Ser Gln Phe Phe Val Asn Ala Val Lys Val Thr Phe Thr Ile Thr  
 1070 1075 1080  
 Val Ile Cys Ala Thr Thr Trp Gln Phe Ile Phe Ile Ile Ile Pro  
 1085 1090 1095  
 Leu Ser Val Phe Tyr Ile Tyr Tyr Gln Gln Tyr Tyr Leu Arg Thr  
 1100 1105 1110  
 Ser Arg Glu Leu Arg Arg Leu Asp Ser Ile Thr Arg Ser Pro Ile  
 1115 1120 1125  
 Tyr Ser His Phe Gln Glu Thr Leu Gly Gly Leu Ala Thr Val Arg  
 1130 1135 1140

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Gly Tyr Ser Gln Gln Lys Arg Phe Ser His Ile Asn Gln Cys Arg  
1145 1150 1155

Ile Asp Asn Asn Met Ser Ala Phe Tyr Pro Ser Ile Asn Ala Asn  
1160 1165 1170

Arg Trp Leu Ala Tyr Arg Leu Glu Leu Ile Gly Ser Ile Ile Ile  
1175 1180 1185

Leu Gly Ala Ala Thr Leu Ser Val Phe Arg Leu Lys Gln Gly Thr  
1190 1195 1200

Leu Thr Ala Gly Met Val Gly Leu Ser Leu Ser Tyr Ala Leu Gln  
1205 1210 1215

Ile Thr Gln Thr Leu Asn Trp Ile Val Arg Met Thr Val Glu Val  
1220 1225 1230

Glu Thr Asn Ile Val Ser Val Glu Arg Ile Lys Glu Tyr Ala Asp  
1235 1240 1245

Leu Lys Ser Glu Ala Pro Leu Ile Val Glu Gly His Arg Pro Pro  
1250 1255 1260

Lys Glu Trp Pro Ser Gln Gly Asp Ile Lys Phe Asn Asn Tyr Ser  
1265 1270 1275

Thr Arg Tyr Arg Pro Glu Leu Asp Leu Val Leu Lys His Ile Asn  
1280 1285 1290

Ile His Ile Lys Pro Asn Glu Lys Val Gly Ile Val Gly Arg Thr  
1295 1300 1305

Gly Ala Gly Lys Ser Ser Leu Thr Leu Ala Leu Phe Arg Met Ile  
1310 1315 1320

Glu Ala Ser Glu Gly Asn Ile Val Ile Asp Asn Ile Ala Ile Asn  
1325 1330 1335

Glu Ile Gly Leu Tyr Asp Leu Arg His Lys Leu Ser Ile Ile Pro  
1340 1345 1350

Gln Asp Ser Gln Val Phe Glu Gly Thr Val Arg Glu Asn Ile Asp  
1355 1360 1365

Pro Ile Asn Gln Tyr Thr Asp Glu Ala Ile Trp Arg Ala Leu Glu  
1370 1375 1380

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Leu Ser His Leu Lys Glu His Val Leu Ser Met Ser Asn Asp Gly  
 1385 1390 1395  
 Leu Asp Ala Gln Leu Thr Glu Gly Gly Gly Asn Leu Ser Val Gly  
 1400 1405 1410  
 Gln Arg Gln Leu Leu Cys Leu Ala Arg Ala Met Leu Val Pro Ser  
 1415 1420 1425  
 Lys Ile Leu Val Leu Asp Glu Ala Thr Ala Ala Val Asp Val Glu  
 1430 1435 1440  
 Thr Asp Lys Val Val Gln Glu Thr Ile Arg Thr Ala Phe Lys Asp  
 1445 1450 1455  
 Arg Thr Ile Leu Thr Ile Ala His Arg Leu Asn Thr Ile Met Asp  
 1460 1465 1470  
 Ser Asp Arg Ile Ile Val Leu Asp Asn Gly Lys Val Ala Glu Phe  
 1475 1480 1485  
 Asp Ser Pro Gly Gln Leu Leu Ser Asp Asn Lys Ser Leu Phe Tyr  
 1490 1495 1500  
 Ser Leu Cys Met Glu Ala Gly Leu Val Asn Glu Asn Gly Gly Gly  
 1505 1510 1515  
 Gly Gly Gly Met Leu Ser Arg Lys Gly Ile Ile Pro Glu Glu Tyr  
 1520 1525 1530  
 Val Leu Thr Arg Leu Ala Glu Asp Pro Ala Glu Pro Arg Tyr Arg  
 1535 1540 1545  
 Thr Arg Glu Arg Arg Ala Arg Phe Val Ser Lys Lys Gly Asn Cys  
 1550 1555 1560  
 Asn Val Ala His Lys Asn Ile Arg Glu Gln Gly Arg Phe Leu Gln  
 1565 1570 1575  
 Asp Val Phe Thr Thr Leu Val Asp Leu Lys Trp Pro His Thr Leu  
 1580 1585 1590  
 Leu Ile Phe Thr Met Ser Phe Leu Cys Ser Trp Leu Leu Phe Ala  
 1595 1600 1605  
 Met Val Trp Trp Leu Ile Ala Phe Ala His Gly Asp Leu Ala Pro  
 1610 1615 1620

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Gly Glu Gly Thr Asn Val Pro Cys Val Thr Ser Ile His Ser Phe  
 1625 1630 1635  
 Ser Ser Ala Phe Leu Phe Ser Ile Glu Val Gln Val Thr Ile Gly  
 1640 1645 1650  
 Phe Gly Gly Arg Met Val Thr Glu Glu Cys Pro Leu Ala Ile Leu  
 1655 1660 1665  
 Ile Leu Ile Val Gln Asn Ile Val Gly Leu Met Ile Asn Ala Ile  
 1670 1675 1680  
 Met Leu Gly Cys Ile Phe Met Lys Thr Ala Gln Ala His Arg Arg  
 1685 1690 1695  
 Ala Glu Thr Leu Ile Phe Ser Lys His Ala Val Ile Thr Leu Arg  
 1700 1705 1710  
 His Gly Arg Leu Cys Phe Met Leu Arg Val Gly Asp Leu Arg Lys  
 1715 1720 1725  
 Ser Met Ile Ile Ser Ala Thr Ile His Met Gln Val Val Arg Lys  
 1730 1735 1740  
 Thr Thr Ser Pro Glu Gly Glu Val Val Pro Leu His Gln Val Asp  
 1745 1750 1755  
 Ile Pro Met Glu Asn Gly Val Gly Gly Asn Gly Ile Phe Leu Val  
 1760 1765 1770  
 Ala Pro Leu Ile Ile Tyr His Val Ile Asp Ser Asn Ser Pro Leu  
 1775 1780 1785  
 Tyr Asp Leu Ala Pro Ser Asp Leu His His His Gln Asp Leu Glu  
 1790 1795 1800  
 Ile Ile Val Ile Leu Glu Gly Val Val Glu Thr Thr Gly Ile Thr  
 1805 1810 1815  
 Thr Gln Ala Arg Thr Ser Tyr Leu Ala Asp Glu Ile Leu Trp Gly  
 1820 1825 1830  
 Gln Arg Phe Val Pro Ile Val Ala Glu Glu Asp Gly Arg Tyr Ser  
 1835 1840 1845  
 Val Asp Tyr Ser Lys Phe Gly Asn Thr Ile Lys Val Pro Thr Pro  
 Page 16



1850

1855

Leu Cys Thr Ala Arg Gln Leu Asp Glu Asp Arg Ser Leu Leu Asp  
1865 1870 1875

Ala Leu Thr Leu Ala Ser Ser Arg Gly Pro Leu Arg Lys Arg Ser  
1880 1885 1890

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1895 1900 1905

Ser Leu Ser  
1910

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Pro His Val Phe Leu Leu Phe Ile Thr Phe Pro Ile Leu Phe Ile Gly  
35 40 45

Trp Gly Ser Gln Ser Ser Lys Val Gln Ile His His Asn Thr Trp Leu  
50 55 60

His Phe Pro Gly His Asn Leu Arg Trp Ile Leu Thr Phe Ala Leu Leu  
65 70 75 80

Phe Val His Val Cys Glu Ile Ala Glu Gly Ile Val Ser Asp Ser Gln  
85 90 95

Arg Ala Ser Arg His Leu His Leu Phe Met Pro Ala Val Met Gly Phe  
100 105 110

Val Ala Thr Thr Thr Ser Ile Val Tyr Tyr His Asn Ile Glu Thr Ser  
115 120 125

Asn Phe Pro Lys Leu Leu Leu Ala Leu Phe Leu Tyr Trp Val Met Ala  
130 135 140

Phe Ile Thr Lys Thr Ile Lys Leu Val Lys Tyr Trp Gln Leu Gly Trp  
17

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145		150		155		160
Gly Met Ser Asp	Leu Arg Phe Cys Ile Thr Gly Val Met Val Ile Leu	165		170		175
Asn Gly Leu	Leu Met Ala Val Glu Ile Asn Val Ile Arg Val Arg Arg	180		185		190
Tyr Val Phe	Phe Met Asn Pro Gln Lys Val Lys Pro Pro Glu Asp Leu	195		200		205
Gln Asp	Leu Gly Val Arg Phe Leu Gln Pro Phe Val Asn Leu Leu Ser	210		215		220
Lys Ala Thr Tyr Trp	Trp Met Asn Thr Leu Ile Ile Ser Ala His Arg	225		230		235
Lys Pro Ile Asp	Leu Lys Ala Ile Gly Lys Leu Pro Ile Ala Met Arg	245		250		255
Ala Val Thr	Asn Tyr Val Cys Leu Lys Glu Ala Tyr Glu Glu Gln Lys	260		265		270
Lys Lys Ala	Ala Asp His Pro Asn Arg Thr Pro Ser Ile Trp Leu Ala	275		280		285
Met Tyr Arg Ala Phe Gly Arg	Pro Ile Leu Leu Ser Ser Thr Phe Arg	290		295		300
Tyr Leu Ala Asp Leu	Leu Gly Phe Ala Gly Pro Leu Cys Ile Ser Gly	305		310		315
Ile Val Gln Arg Val	Asn Glu Pro Lys Asn Asn Thr Thr Arg Phe Ser	325		330		335
Glu Thr Leu Ser Ser Lys Glu Phe	Leu Glu Asn Ala His Val Leu Ala	340		345		350
Val Leu Leu Phe Leu Ala Leu Ile Leu Gln Arg Thr Phe Leu Gln Ala		355		360		365
Ser Tyr Tyr Val Thr Ile Glu Thr Gly Ile Asn Leu Arg Gly Ala Leu		370		375		380
Leu Ala Met Ile Tyr Asn Lys Ile Leu Arg Leu Ser Thr Ser Asn Leu		385		390		395
						400

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Ser Met Gly Glu Met Thr Leu Gly Gln Ile Asn Asn Leu Val Ala Ile  
405 410 415

Glu Thr Asn Gln Leu Met Trp Phe Leu Phe Leu Cys Pro Asn Leu Trp  
420 425 430

Ala Met Pro Val Gln Ile Ile Met Gly Val Ile Leu Leu Tyr Asn Leu  
435 440 445

Leu Gly Ser Ser Ala Leu Val Gly Ala Ala Val Ile Val Leu Leu Ala  
450 455 460

Pro Ile Gln Tyr Phe Ile Ala Thr Lys Leu Ala Glu Ala Gln Lys Ser  
465 470 475 480

Thr Leu Asp Tyr Ser Thr Glu Arg Leu Lys Lys Thr Asn Glu Ile Leu  
485 490 495

Lys Gly Ile Lys Leu Leu Lys Leu Tyr Ala Trp Glu His Ile Phe Cys  
500 505 510

Lys Ser Val Glu Glu Thr Arg Met Lys Glu Leu Ser Ser Leu Lys Thr  
515 520 525

Phe Ala Leu Tyr Thr Ser Leu Ser Ile Phe Met Asn Ala Ala Ile Pro  
530 535 540

Ile Ala Ala Val Leu Ala Thr Phe Val Thr His Ala Tyr Ala Ser Gly  
545 550 555 560

Asn Asn Leu Lys Pro Ala Glu Ala Phe Ala Ser Leu Ser Leu Phe His  
565 570 575

Ile Leu Val Thr Pro Leu Phe Leu Leu Ser Thr Val Val Arg Phe Ala  
580 585 590

Val Lys Ala Ile Ile Ser Val Gln Lys Leu Asn Glu Phe Leu Leu Ser  
595 600 605

Asp Glu Ile Gly Glu Asp Ser Trp Arg Thr Gly Glu Gly Thr Leu Pro  
610 615 620

Phe Glu Ser Cys Lys Lys His Thr Gly Val Gln Ser Lys Pro Ile Asn  
625 630 635 640

Arg Lys Gln Pro Gly Arg Tyr His Leu Asp Asn Tyr Glu Gln Ala Arg  
645 650 655

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Arg Leu Arg Pro Ala Glu Thr Glu Asp Val Ala Ile Lys Val Thr Asn  
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Gly Tyr Phe Ser Trp Gly Ser Gly Leu Ala Thr Leu Ser Asn Ile Asp  
675 680 685

Ile Arg Ile Pro Thr Gly Gln Leu Thr Met Ile Val Gly Gln Val Gly  
690 695 700

Cys Gly Lys Ser Ser Leu Leu Leu Ala Ile Leu Gly Glu Met Gln Thr  
705 710 715 720

Leu Glu Gly Lys Val Tyr Trp Asn Asn Val Asn Glu Ser Glu Pro Ser  
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Phe Glu Ala Thr Arg Ser Arg Ser Arg Tyr Ser Val Ala Tyr Ala Ala  
740 745 750

Gln Lys Pro Trp Leu Leu Asn Ala Thr Val Glu Glu Asn Ile Thr Phe  
755 760 765

Gly Ser Ser Phe Asn Arg Gln Arg Tyr Lys Ala Val Thr Asp Ala Cys  
770 775 780

Ser Leu Gln Pro Asp Ile Asp Leu Leu Pro Phe Gly Asp Gln Thr Glu  
785 790 795 800

Ile Gly Glu Arg Gly Ile Asn Leu Ser Gly Gly Gln Arg Gln Arg Ile  
805 810 815

Cys Val Ala Arg Ala Leu Tyr Gln Asn Thr Asn Ile Val Phe Leu Asp  
820 825 830

Asp Pro Phe Ser Ala Leu Asp Ile His Leu Ser Asp His Leu Met Gln  
835 840 845

Glu Gly Ile Leu Lys Phe Leu Gln Asp Asp Lys Arg Thr Val Val Leu  
850 855 860

Val Thr His Lys Leu Gln Tyr Leu Thr His Ala Asp Trp Ile Ile Ala  
865 870 875 880

Met Lys Asp Gly Ser Val Leu Arg Glu Gly Thr Leu Lys Asp Ile Gln  
885 890 895

Thr Lys Asp Val Glu Leu Tyr Glu His Trp Lys Thr Leu Met Asn Arg  
900 905 910

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Gln Asp Gln Glu Leu Glu Lys Asp Met Glu Ala Asp Gln Thr Thr Leu  
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Glu Arg Lys Thr Leu Arg Arg Ala Met Tyr Ser Arg Glu Ala Lys Ala  
930 935 940

Gln Met Glu Asp Glu Asp Glu Glu Glu Glu Glu Glu Asp Glu Asp  
945 950 955 960

Asp Asn Met Ser Thr Val Met Arg Leu Arg Thr Lys Met Pro Trp Lys  
965 970 975

Thr Cys Trp Trp Tyr Leu Thr Ser Gly Gly Phe Phe Leu Leu Phe Leu  
980 985 990

Met Ile Phe Ser Lys Leu Leu Lys His Ser Val Ile Val Ala Ile Asp  
995 1000 1005

Tyr Trp Leu Ala Thr Trp Thr Ser Glu Tyr Ser Ile Asn Asp Pro  
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Gly Lys Ala Asp Gln Thr Phe Tyr Val Ala Gly Phe Ser Ile Leu  
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Cys Gly Ala Gly Ile Phe Leu Cys Leu Val Thr Ser Leu Thr Val  
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Glu Trp Met Gly Leu Thr Ala Ala Lys Asn Leu His His Asn Leu  
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Leu Asn Lys Ile Ile Leu Gly Pro Ile Arg Phe Phe Asp Thr Thr  
1070 1075 1080

Pro Leu Gly Leu Ile Leu Asn Arg Phe Ser Ala Asp Thr Asn Ile  
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Ile Asp Gln His Ile Pro Pro Thr Leu Glu Ser Leu Thr Arg Ser  
1100 1105 1110

Thr Leu Leu Cys Leu Ser Ala Ile Gly Met Ile Ser Tyr Ala Thr  
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Pro Val Phe Leu Ile Ala Leu Ala Pro Leu Gly Val Ala Phe Tyr  
1130 1135 1140

Phe Ile Gln Lys Tyr Phe Arg Val Ala Ser Lys Asp Leu Gln Glu  
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1155

1145                      1150

Leu Asp 1160 Asp Ser Thr Gln Leu 1165 Pro Leu Leu Cys His 1170 Phe Ser Glu

Thr Ala 1175 Glu Gly Leu Thr Thr 1180 Ile Arg Ala Phe Arg 1185 His Glu Thr

Arg Phe 1190 Lys Gln Arg Met Leu 1195 Glu Leu Thr Asp Thr 1200 Asn Asn Ile

Ala Tyr 1205 Leu Phe Leu Ser Ala 1210 Ala Asn Arg Trp Leu 1215 Glu Val Arg

Thr Asp 1220 Tyr Leu Gly Ala Cys 1225 Ile Val Leu Thr Ala 1230 Ser Ile Ala

Ser Ile 1235 Ser Gly Ser Ser Asn 1240 Ser Gly Leu Val Gly 1245 Leu Gly Leu

Leu Tyr 1250 Ala Leu Thr Ile Thr 1255 Asn Tyr Leu Asn Trp 1260 Val Val Arg

Asn Leu 1265 Ala Asp Leu Glu Val 1270 Gln Met Gly Ala Val 1275 Lys Lys Val

Asn Ser 1280 Phe Leu Thr Met Glu 1285 Ser Glu Asn Tyr Glu 1290 Gly Thr Met

Asp Pro 1295 Ser Gln Val Pro Glu 1300 His Trp Pro Gln Glu 1305 Gly Glu Ile

Lys Ile 1310 His Asp Leu Cys Val 1315 Arg Tyr Glu Asn Asn 1320 Leu Lys Pro

Val Leu 1325 Lys His Val Lys Ala 1330 Tyr Ile Lys Pro Gly 1335 Gln Lys Val

Gly Ile 1340 Cys Gly Arg Thr Gly 1345 Ser Gly Lys Ser Ser 1350 Leu Ser Leu

Ala Phe 1355 Phe Arg Met Val Asp 1360 Ile Phe Asp Gly Lys 1365 Ile Val Ile

Asp Gly 1370 Ile Asp Ile Ser Lys 1375 Leu Pro Leu His Thr 1380 Leu Arg Ser

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Ile Arg 1400	Phe Asn Leu Asp 1405	Pro Glu Cys Lys Cys 1410	Thr Asp Asp Arg	
Leu Trp 1415	Glu Ala Leu Glu 1420	Ile Ala Gln Leu Lys 1425	Asn Met Val Lys	
Ser Leu 1430	Pro Gly Gly Leu 1435	Asp Ala Thr Val Thr 1440	Glu Gly Gly Glu	
Asn Phe 1445	Ser Val Gly Gln 1450	Arg Gln Leu Phe Cys 1455	Leu Ala Arg Ala	
Phe Val 1460	Arg Lys Ser Ser 1465	Ile Leu Ile Met Asp 1470	Glu Ala Thr Ala	
Ser Ile 1475	Asp Met Ala Thr 1480	Glu Asn Ile Leu Gln 1485	Lys Val Val Met	
Thr Ala 1490	Phe Ala Asp Arg 1495	Thr Val Val Thr Ile 1500	Ala His Arg Val	
Ser Ser 1505	Ile Met Asp Ala 1510	Gly Leu Val Leu Val 1515	Phe Ser Glu Gly	
Ile Leu 1520	Val Glu Cys Asp 1525	Thr Gly Pro Asn Leu 1530	Leu Gln His Lys	
Asn Gly 1535	Leu Phe Ser Thr 1540	Leu Val Met Thr Asn 1545	Lys Gly Gly Gly	
Gly Gly 1550	Gly Met Leu Ser 1555	Arg Lys Gly Ile Ile 1560	Pro Glu Glu Tyr	
Val Leu 1565	Thr Arg Leu Ala 1570	Glu Asp Pro Ala Glu 1575	Pro Arg Tyr Arg	
Thr Arg 1580	Glu Arg Arg Ala 1585	Arg Phe Val Ser Lys 1590	Lys Gly Asn Cys	
Asn Val 1595	Ala His Lys Asn 1600	Ile Arg Glu Gln Gly 1605	Arg Phe Leu Gln	
Asp Val 1610	Phe Thr Thr Leu 1615	Val Asp Leu Lys Trp 1620	Pro His Thr Leu	

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Leu Ile Phe Thr Met Ser Phe Leu Cys Ser Trp Leu Phe Ala  
 1625 1630 1635  
 Met Val Trp Trp Leu Ile Ala Phe Ala His Gly Asp Leu Ala Pro  
 1640 1645 1650  
 Gly Glu Gly Thr Asn Val Pro Cys Val Thr Ser Ile His Ser Phe  
 1655 1660 1665  
 Ser Ser Ala Phe Leu Phe Ser Ile Glu Val Gln Val Thr Ile Gly  
 1670 1675 1680  
 Phe Gly Gly Arg Met Val Thr Glu Glu Cys Pro Leu Ala Ile Leu  
 1685 1690 1695  
 Ile Leu Ile Val Gln Asn Ile Val Gly Leu Met Ile Asn Ala Ile  
 1700 1705 1710  
 Met Leu Gly Cys Ile Phe Met Lys Thr Ala Gln Ala His Arg Arg  
 1715 1720 1725  
 Ala Glu Thr Leu Ile Phe Ser Lys His Ala Val Ile Thr Leu Arg  
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 His Gly Arg Leu Cys Phe Met Leu Arg Val Gly Asp Leu Arg Lys  
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 Ser Met Ile Ile Ser Ala Thr Ile His Met Gln Val Val Arg Lys  
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 Thr Thr Ser Pro Glu Gly Glu Val Val Pro Leu His Gln Val Asp  
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 Ile Pro Met Glu Asn Gly Val Gly Gly Asn Gly Ile Phe Leu Val  
 1790 1795 1800  
 Ala Pro Leu Ile Ile Tyr His Val Ile Asp Ser Asn Ser Pro Leu  
 1805 1810 1815  
 Tyr Asp Leu Ala Pro Ser Asp Leu His His His Gln Asp Leu Glu  
 1820 1825 1830  
 Ile Ile Val Ile Leu Glu Gly Val Val Glu Thr Thr Gly Ile Thr  
 1835 1840 1845  
 Thr Gln Ala Arg Thr Ser Tyr Leu Ala Asp Glu Ile Leu Trp Gly  
 1850 1855 1860



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Gln Arg Phe Val Pro Ile Val Ala Glu Glu Asp Gly Arg Tyr Ser  
1865 1870 1875

Val Asp Tyr Ser Lys Phe Gly Asn Thr Ile Lys Val Pro Thr Pro  
1880 1885 1890

Leu Cys Thr Ala Arg Gln Leu Asp Glu Asp Arg Ser  
1895 1900 1905

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Phe Gln Asn Thr Val Leu Val Trp Val Pro Cys Phe Tyr Leu Trp Ala  
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Cys Phe Pro Phe Tyr Phe Leu Tyr Leu Ser Arg His Asp Arg Gly Tyr  
50 55 60

Ile Gln Met Thr Pro Leu Asn Lys Thr Lys Thr Ala Leu Gly Phe Leu  
65 70 75 80

Leu Trp Ile Val Cys Trp Ala Asp Leu Phe Tyr Ser Phe Trp Glu Arg  
85 90 95

Ser Arg Gly Ile Phe Leu Ala Pro Val Phe Leu Val Ser Pro Thr Leu  
100 105 110

Leu Gly Ile Thr Thr Leu Leu Ala Thr Phe Leu Ile Gln Leu Glu Arg  
115 120 125

Arg Lys Gly Val Gln Ser Ser Gly Ile Met Leu Thr Phe Trp Leu Val  
130 135 140

Ala Leu Val Cys Ala Leu Ala Ile Leu Arg Ser Lys Ile Met Thr Ala  
145 150 155 160

Leu Lys Glu Asp Ala Gln Val Asp Leu Phe Arg Asp Ile Thr Phe Tyr  
165 170 175  
Page 25

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Val Tyr Phe Ser Leu Leu Leu Ile Gln Leu Val Leu Ser Cys Phe Ser  
180 185 190

Asp Arg Ser Pro Leu Phe Ser Glu Thr Ile His Asp Pro Asn Pro Cys  
195 200 205

Pro Glu Ser Ser Ala Ser Phe Leu Ser Arg Ile Thr Phe Trp Trp Ile  
210 215 220

Thr Gly Leu Ile Val Arg Gly Tyr Arg Gln Pro Leu Glu Gly Ser Asp  
225 230 235 240

Leu Trp Ser Leu Asn Lys Glu Asp Thr Ser Glu Gln Val Val Pro Val  
245 250 255

Leu Val Lys Asn Trp Lys Lys Glu Cys Ala Lys Thr Arg Lys Gln Pro  
260 265 270

Val Lys Val Val Tyr Ser Ser Lys Asp Pro Ala Gln Pro Lys Glu Ser  
275 280 285

Ser Lys Val Asp Ala Asn Glu Glu Val Glu Ala Leu Ile Val Lys Ser  
290 295 300

Pro Gln Lys Glu Trp Asn Pro Ser Leu Phe Lys Val Leu Tyr Lys Thr  
305 310 315 320

Phe Gly Pro Tyr Phe Leu Met Ser Phe Phe Phe Lys Ala Ile His Asp  
325 330 335

Leu Met Met Phe Ser Gly Pro Gln Ile Leu Lys Leu Leu Ile Lys Phe  
340 345 350

Val Asn Asp Thr Lys Ala Pro Asp Trp Gln Gly Tyr Phe Tyr Thr Val  
355 360 365

Leu Leu Phe Val Thr Ala Cys Leu Gln Thr Leu Val Leu His Gln Tyr  
370 375 380

Phe His Ile Cys Phe Val Ser Gly Met Arg Ile Lys Thr Ala Val Ile  
385 390 395 400

Gly Ala Val Tyr Arg Lys Ala Leu Val Ile Thr Asn Ser Ala Arg Lys  
405 410 415

Ser Ser Thr Val Gly Glu Ile Val Asn Leu Met Ser Val Asp Ala Gln  
Page 26

420

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425

430

Arg Phe Met Asp Leu Ala Thr Tyr Ile Asn Met Ile Trp Ser Ala Pro  
 435 440 445

Leu Gln Val Ile Leu Ala Leu Tyr Leu Leu Trp Leu Asn Leu Gly Pro  
 450 455 460

Ser Val Leu Ala Gly Val Ala Val Met Val Leu Met Val Pro Val Asn  
 465 470 475 480

Ala Val Met Ala Met Lys Thr Lys Thr Tyr Gln Val Ala His Met Lys  
 485 490 495

Ser Lys Asp Asn Arg Ile Lys Leu Met Asn Glu Ile Leu Asn Gly Ile  
 500 505 510

Lys Val Leu Lys Leu Tyr Ala Trp Glu Leu Ala Phe Lys Asp Lys Val  
 515 520 525

Leu Ala Ile Arg Gln Glu Glu Leu Lys Val Leu Lys Lys Ser Ala Tyr  
 530 535 540

Leu Ser Ala Val Gly Thr Phe Thr Trp Val Cys Thr Pro Phe Leu Val  
 545 550 555 560

Ala Leu Cys Thr Phe Ala Val Tyr Val Thr Ile Asp Glu Asn Asn Ile  
 565 570 575

Leu Asp Ala Gln Thr Ala Phe Val Ser Leu Ala Leu Phe Asn Ile Leu  
 580 585 590

Arg Phe Pro Leu Asn Ile Leu Pro Met Val Ile Ser Ser Ile Val Gln  
 595 600 605

Ala Ser Val Ser Leu Lys Arg Leu Arg Ile Phe Leu Ser His Glu Glu  
 610 615 620

Leu Glu Pro Asp Ser Ile Glu Arg Arg Pro Val Lys Asp Gly Gly Gly  
 625 630 635 640

Thr Asn Ser Ile Thr Val Arg Asn Ala Thr Phe Thr Trp Ala Arg Ser  
 645 650 655

Asp Pro Pro Thr Leu Asn Gly Ile Thr Phe Ser Ile Pro Glu Gly Ala  
 660 665 670

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Leu Val Ala Val Val Gly Gln Val Gly Cys Gly Lys Ser Ser Leu Leu  
675 680

Ser Ala Leu Leu Ala Glu Met Asp Lys Val Glu Gly His Val Ala Ile  
690 695 700

Lys Gly Ser Val Ala Tyr Val Pro Gln Gln Ala Trp Ile Gln Asn Asp  
705 710 715 720

Ser Leu Arg Glu Asn Ile Leu Phe Gly Cys Gln Leu Glu Glu Pro Tyr  
725 730 735

Tyr Arg Ser Val Ile Gln Ala Cys Ala Leu Leu Pro Asp Leu Glu Ile  
740 745 750

Leu Pro Ser Gly Asp Arg Thr Glu Ile Gly Glu Lys Gly Val Asn Leu  
755 760 765

Ser Gly Gly Gln Lys Gln Arg Val Ser Leu Ala Arg Ala Val Tyr Ser  
770 775 780

Asn Ala Asp Ile Tyr Leu Phe Asp Asp Pro Leu Ser Ala Val Asp Ala  
785 790 795 800

His Val Gly Lys His Ile Phe Glu Asn Val Ile Gly Pro Lys Gly Met  
805 810 815

Leu Lys Asn Lys Thr Arg Ile Leu Val Thr His Ser Met Ser Tyr Leu  
820 825 830

Pro Gln Val Asp Val Ile Ile Val Met Ser Gly Gly Lys Ile Ser Glu  
835 840 845

Met Gly Ser Tyr Gln Glu Leu Leu Ala Arg Asp Gly Ala Phe Ala Glu  
850 855 860

Phe Leu Arg Thr Tyr Ala Ser Thr Glu Gln Glu Gln Asp Ala Glu Glu  
865 870 875 880

Asn Gly Val Thr Gly Val Ser Gly Pro Gly Lys Glu Ala Lys Gln Met  
885 890 895

Glu Asn Gly Met Leu Val Thr Asp Ser Ala Gly Lys Gln Leu Gln Arg  
900 905 910

Gln Leu Ser Ser Ser Ser Tyr Ser Gly Asp Ile Ser Arg His His  
915 920 925

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Asn Ser Thr Ala Glu Leu Gln Lys Lys Ala Glu Ala Lys Lys Glu Glu Thr  
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 Trp Lys Leu Met Glu Ala Asp Lys Ala Gln Thr Gly Gln Val Lys Leu  
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 Ser Val Tyr Trp Asp Tyr Met Lys Ala Ile Gly Leu Phe Ile Ser Phe  
 965 970 975  
 Leu Ser Ile Phe Leu Phe Met Cys Asn His Val Ser Ala Leu Ala Ser  
 980 985 990  
 Asn Tyr Trp Leu Ser Leu Trp Thr Asp Asp Pro Ile Val Asn Gly Thr  
 995 1000 1005  
 Gln Glu His Thr Lys Val Arg Leu Ser Val Tyr Gly Ala Leu Gly  
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 Ile Ser Gln Gly Ile Ala Val Phe Gly Tyr Ser Met Ala Val Ser  
 1025 1030 1035  
 Ile Gly Gly Ile Leu Ala Ser Arg Cys Leu His Val Asp Leu Leu  
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 Ser Gly Asn Leu Val Asn Arg Phe Ser Lys Glu Leu Asp Thr Val  
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 Asp Ser Met Ile Pro Glu Val Ile Lys Met Phe Met Gly Ser Leu  
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 Phe Asn Val Ile Gly Ala Cys Ile Val Ile Leu Leu Ala Thr Pro  
 1100 1105 1110  
 Ile Ala Ala Ile Ile Ile Pro Pro Leu Gly Leu Ile Tyr Phe Phe  
 1115 1120 1125  
 Val Gln Arg Phe Tyr Val Ala Ser Ser Arg Gln Leu Lys Arg Leu  
 1130 1135 1140  
 Glu Ser Val Ser Arg Ser Pro Val Tyr Ser His Phe Asn Glu Thr  
 1145 1150 1155  
 Leu Leu Gly Val Ser Val Ile Arg Ala Phe Glu Glu Gln Glu Arg  
 1160 1165 1170

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Phe Ile His Gln Ser Asp Leu Lys Val Asp Glu Asn Gln Lys Ala  
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 Tyr Tyr Pro Ser Ile Val Ala Asn Arg Trp Leu Ala Val Arg Leu  
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 Glu Cys Val Gly Asn Cys Ile Val Leu Phe Ala Ala Leu Phe Ala  
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 Val Ile Ser Arg His Ser Leu Ser Ala Gly Leu Val Gly Leu Ser  
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 Val Ser Tyr Ser Leu Gln Val Thr Thr Tyr Leu Asn Trp Leu Val  
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 Arg Met Ser Ser Glu Met Glu Thr Asn Ile Val Ala Val Glu Arg  
 1250 1255 1260  
 Leu Lys Glu Tyr Ser Glu Thr Glu Lys Glu Ala Pro Trp Gln Ile  
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 Glu Phe Arg Asn Tyr Cys Leu Arg Tyr Arg Glu Asp Leu Asp Phe  
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 Val Leu Arg His Ile Asn Val Thr Ile Asn Gly Gly Glu Lys Val  
 1310 1315 1320  
 Gly Ile Val Gly Arg Thr Gly Ala Gly Lys Ser Ser Leu Thr Leu  
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 Gly Leu Phe Arg Ile Asn Glu Ser Ala Glu Gly Glu Ile Ile Ile  
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 Asp Gly Ile Asn Ile Ala Lys Ile Gly Leu His Asp Leu Arg Phe  
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 Lys Ile Thr Ile Ile Pro Gln Asp Pro Val Leu Phe Ser Gly Ser  
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 Leu Arg Met Asn Leu Asp Pro Phe Ser Gln Tyr Ser Asp Glu Glu  
 1385 1390 1395  
 Val Trp Thr Ser Leu Glu Leu Ala His Leu Lys Asp Phe Val Ser  
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1400

1405

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1415 1420 1425Asn Leu Ser Val Gly Gln Arg Gln Leu Val Cys Leu Ala Arg Ala  
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1565 1570 1575Cys Asn Val Ala His Lys Asn Ile Arg Glu Gln Gly Arg Phe Leu  
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1625 1630 1635

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Pro Gly Glu Gly Thr Asn Val Pro Cys Val Thr Ser Ile His Ser  
1640 1645 1650

Phe Ser Ser Ala Phe Leu Phe Ser Ile Glu Val Gln Val Thr Ile  
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Gly Phe Gly Gly Arg Met Val Thr Glu Glu Cys Pro Leu Ala Ile  
1670 1675 1680

Leu Ile Leu Ile Val Gln Asn Ile Val Gly Leu Met Ile Asn Ala  
1685 1690 1695

Ile Met Leu Gly Cys Ile Phe Met Lys Thr Ala Gln Ala His Arg  
1700 1705 1710

Arg Ala Glu Thr Leu Ile Phe Ser Lys His Ala Val Ile Thr Leu  
1715 1720 1725

Arg His Gly Arg Leu Cys Phe Met Leu Arg Val Gly Asp Leu Arg  
1730 1735 1740

Lys Ser Met Ile Ile Ser Ala Thr Ile His Met Gln Val Val Arg  
1745 1750 1755

Lys Thr Thr Ser Pro Glu Gly Glu Val Val Pro Leu His Gln Val  
1760 1765 1770

Asp Ile Pro Met Glu Asn Gly Val Gly Gly Asn Gly Ile Phe Leu  
1775 1780 1785

Val Ala Pro Leu Ile Ile Tyr His Val Ile Asp Ser Asn Ser Pro  
1790 1795 1800

Leu Tyr Asp Leu Ala Pro Ser Asp Leu His His His Gln Asp Leu  
1805 1810 1815

Glu Ile Ile Val Ile Leu Glu Gly Val Val Glu Thr Thr Gly Ile  
1820 1825 1830

Thr Thr Gln Ala Arg Thr Ser Tyr Leu Ala Asp Glu Ile Leu Trp  
1835 1840 1845

Gly Gln Arg Phe Val Pro Ile Val Ala Glu Glu Asp Gly Arg Tyr  
1850 1855 1860

Ser Val Asp Tyr Ser Lys Phe Gly Asn Thr Ile Lys Val Pro Thr  
1865 1870 1875



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Pro Leu Cys Thr Ala Arg Gln Leu Asp Glu Asp Arg Ser  
1880 1885 1890

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35 40 45

Gly Ile Arg Asp Leu Val Asn Leu Cys Lys Lys Lys His Ser Gly Ile  
50 55 60

Lys Tyr Arg Arg Asn Trp Ile Ile Val Ser Arg Met Ala Leu Val Leu  
65 70 75 80

Leu Glu Ile Ala Phe Val Ser Leu Ala Ser Leu Asn Ile Ser Lys Glu  
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Glu Ala Glu Asn Phe Thr Ile Val Ser Gln Tyr Ala Ser Thr Met Leu  
100 105 110

Ser Leu Phe Val Ala Leu Ala Leu His Trp Ile Glu Tyr Asp Arg Ser  
115 120 125

Val Val Ala Asn Thr Val Leu Leu Phe Tyr Trp Leu Phe Glu Thr Phe  
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Gly Asn Phe Ala Lys Leu Ile Asn Ile Leu Ile Arg His Thr Tyr Glu  
145 150 155 160

Gly Ile Trp Tyr Ser Gly Gln Thr Gly Phe Ile Leu Thr Leu Phe Gln  
165 170 175

Val Ile Thr Cys Ala Ser Ile Leu Leu Leu Glu Ala Leu Pro Lys Lys  
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Pro Leu Met Pro His Gln His Ile His Gln Thr Leu Thr Arg Arg Lys  
195 200 205

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Pro Asn Pro Tyr Asp Ser Ala Asn Ile Phe Ser Arg Ile Thr Phe Ser  
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Trp Met Ser Gly Leu Met Lys Thr Gly Tyr Glu Lys Tyr Leu Val Glu  
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Ala Asp Leu Tyr Lys Leu Pro Arg Asn Phe Ser Ser Glu Glu Leu Ser  
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Gln Lys Leu Glu Lys Asn Trp Glu Asn Glu Leu Lys Gln Lys Ser Asn  
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Pro Ser Leu Ser Trp Ala Ile Cys Arg Thr Phe Gly Ser Lys Met Leu  
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Leu Ala Ala Phe Phe Lys Ala Ile His Asp Val Leu Ala Phe Thr Gln  
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Pro Gln Leu Leu Arg Ile Leu Ile Lys Phe Val Thr Asp Tyr Asn Ser  
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Glu Arg Gln Asp Asp His Ser Ser Leu Gln Gly Phe Glu Asn Asn His  
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Pro Gln Lys Leu Pro Ile Val Arg Gly Phe Leu Ile Ala Phe Ala Met  
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Phe Leu Val Gly Phe Thr Gln Thr Ser Val Leu His Gln Tyr Phe Leu  
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Asn Val Phe Asn Thr Gly Met Tyr Ile Lys Ser Ala Leu Thr Ala Leu  
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Ile Tyr Gln Lys Ser Leu Val Leu Ser Asn Glu Ala Ser Gly Leu Ser  
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Gln Asp Leu Thr Gln Trp Leu Asn Leu Ile Trp Ser Gly Pro Phe Gln  
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Trp Val Gly Val Ile Ile Leu Val Ile Met Met Pro Leu Asn Ser Phe  
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 Leu Lys Leu Tyr Ala Trp Glu Lys Pro Tyr Arg Glu Lys Leu Glu Glu  
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 Val Arg Asn Asn Lys Glu Leu Lys Asn Leu Thr Lys Leu Gly Cys Tyr  
 515 520 525  
 Met Ala Val Thr Ser Phe Gln Phe Asn Ile Val Pro Phe Leu Val Ser  
 530 535 540  
 Cys Cys Thr Phe Ala Val Phe Val Tyr Thr Glu Asp Arg Ala Leu Thr  
 545 550 555 560  
 Thr Asp Leu Val Phe Pro Ala Leu Thr Leu Phe Asn Leu Leu Ser Phe  
 565 570 575  
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 Val Ser Ile Gly Arg Leu Phe Thr Phe Phe Thr Asn Glu Glu Leu Gln  
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 Pro Asp Ser Val Gln Arg Leu Pro Lys Val Lys Asn Ile Gly Asp Val  
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 Ala Ile Asn Ile Gly Asp Asp Ala Thr Phe Leu Trp Gln Arg Lys Pro  
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 Glu Tyr Lys Val Ala Leu Lys Asn Ile Asn Phe Gln Ala Lys Lys Gly  
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Ala Ile Tyr Phe Ala Leu Gly Ile Gly Ser Ala Leu Ala Thr Leu Ile  
995 1000 1005

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Tyr Leu His Asn Leu Met Thr Asn Ser Val Leu Arg Ala Pro Met  
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Thr Phe Phe Glu Thr Thr Pro Ile Gly Arg Ile Leu Asn Arg Phe  
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Ser Asn Asp Ile Tyr Lys Val Asp Ala Leu Leu Gly Arg Thr Phe  
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Ser Gln Phe Phe Val Asn Ala Val Lys Val Thr Phe Thr Ile Thr  
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Val Ile Cys Ala Thr Thr Trp Gln Phe Ile Phe Ile Ile Ile Pro  
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Leu Ser Val Phe Tyr Ile Tyr Tyr Gln Gln Tyr Tyr Leu Arg Thr  
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Ser Arg Glu Leu Arg Arg Leu Asp Ser Ile Thr Arg Ser Pro Ile  
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Tyr Ser His Phe Gln Glu Thr Leu Gly Gly Leu Ala Thr Val Arg  
1130 1135 1140

Gly Tyr Ser Gln Gln Lys Arg Phe Ser His Ile Asn Gln Cys Arg  
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Ile Asp Asn Asn Met Ser Ala Phe Tyr Pro Ser Ile Asn Ala Asn  
1160 1165 1170

Arg Trp Leu Ala Tyr Arg Leu Glu Leu Ile Gly Ser Ile Ile Ile  
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Leu Gly Ala Ala Thr Leu Ser Val Phe Arg Leu Lys Gln Gly Thr  
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 Ile His Ile Lys Pro Asn Glu Lys Val Gly Ile Val Gly Arg Thr  
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Thr Asp Lys Val Val Gln Glu Thr Ile Arg Thr Ala Phe Lys Asp  
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Arg Thr Ile Leu Thr Ile Ala His Arg Leu Asn Thr Ile Met Asp  
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Ser Asp Arg Ile Ile Val Leu Asp Asn Gly Lys Val Ala Glu Phe  
 1475 1480 1485

Asp Ser Pro Gly Gln Leu Leu Ser Asp Asn Lys Ser Leu Phe Tyr  
 1490 1495 1500

Ser Leu Cys Met Glu Ala Gly Leu Val Asn Glu Asn Gly Gly Gly  
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Gly Gly Gly Met Leu Ser Arg Lys Gly Ile Ile Pro Glu Glu Tyr  
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Val Leu Thr Arg Leu Ala Glu Asp Pro Ala Glu Pro Arg Tyr Arg  
 1535 1540 1545

Thr Arg Glu Arg Arg Ala Arg Phe Val Ser Lys Lys Gly Asn Cys  
 1550 1555 1560

Asn Val Ala His Lys Asn Ile Arg Glu Gln Gly Arg Phe Leu Gln  
 1565 1570 1575

Asp Val Phe Thr Thr Leu Val Asp Leu Lys Trp Pro His Thr Leu  
 1580 1585 1590

Leu Ile Phe Thr Met Ser Phe Leu Cys Ser Trp Leu Leu Phe Ala  
 1595 1600 1605

Met Val Trp Trp Leu Ile Ala Phe Ala His Gly Asp Leu Ala Pro  
 1610 1615 1620

Gly Glu Gly Thr Asn Val Pro Cys Val Thr Ser Ile His Ser Phe  
 1625 1630 1635

Ser Ser Ala Phe Leu Phe Ser Ile Glu Val Gln Val Thr Ile Gly  
 1640 1645 1650

Phe Gly Gly Arg Met Val Thr Glu Glu Cys Pro Leu Ala Ile Leu  
 1655 1660 1665

Ile Leu Ile Val Gln Asn Ile Val Gly Leu Met Ile Asn Ala Ile

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1680

1670

1675

Met Leu Gly Cys Ile Phe Met Lys Thr Ala Gln Ala His Arg Arg  
1685 1690 1695

Ala Glu Thr Leu Ile Phe Ser Lys His Ala Val Ile Thr Leu Arg  
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His Gly Arg Leu Cys Phe Met Leu Arg Val Gly Asp Leu Arg Lys  
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Ser Met Ile Ile Ser Ala Thr Ile His Met Gln Val Val Arg Lys  
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Thr Thr Ser Pro Glu Gly Glu Val Val Pro Leu His Gln Val Asp  
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Ile Pro Met Glu Asn Gly Val Gly Gly Asn Gly Ile Phe Leu Val  
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Ala Pro Leu Ile Ile Tyr His Val Ile Asp Ser Asn Ser Pro Leu  
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Tyr Asp Leu Ala Pro Ser Asp Leu His His His Gln Asp Leu Glu  
1790 1795 1800

Ile Ile Val Ile Leu Glu Gly Val Val Glu Thr Thr Gly Ile Thr  
1805 1810 1815

Thr Gln Ala Arg Thr Ser Tyr Leu Ala Asp Glu Ile Leu Trp Gly  
1820 1825 1830

Gln Arg Phe Val Pro Ile Val Ala Glu Glu Asp Gly Arg Tyr Ser  
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Val Asp Tyr Ser Lys Phe Gly Asn Thr Ile Lys Val Pro Thr Pro  
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Phe Gln Asn Thr Val Leu Val Trp Val Pro Cys Phe Tyr Leu Trp Ala	35	40	45
Cys Phe Pro Phe Tyr Phe Leu Tyr Leu Ser Arg His Asp Arg Gly Tyr	50	55	60
Ile Gln Met Thr Pro Leu Asn Lys Thr Lys Thr Ala Leu Gly Phe Leu	65	70	75
Leu Trp Ile Val Cys Trp Ala Asp Leu Phe Tyr Ser Phe Trp Glu Arg	85	90	95
Ser Arg Gly Ile Phe Leu Ala Pro Val Phe Leu Val Ser Pro Thr Leu	100	105	110
Leu Gly Ile Thr Thr Leu Leu Ala Thr Phe Leu Ile Gln Leu Glu Arg	115	120	125
Arg Lys Gly Val Gln Ser Ser Gly Ile Met Leu Thr Phe Trp Leu Val	130	135	140
Ala Leu Val Cys Ala Leu Ala Ile Leu Arg Ser Lys Ile Met Thr Ala	145	150	155
Leu Lys Glu Asp Ala Gln Val Asp Leu Phe Arg Asp Ile Thr Phe Tyr	165	170	175
Val Tyr Phe Ser Leu Leu Leu Ile Gln Leu Val Leu Ser Cys Phe Ser	180	185	190
Asp Arg Ser Pro Leu Phe Ser Glu Thr Ile His Asp Pro Asn Pro Cys	195	200	205
Pro Glu Ser Ser Ala Ser Phe Leu Ser Arg Ile Thr Phe Trp Trp Ile	210	215	220
Thr Gly Leu Ile Val Arg Gly Tyr Arg Gln Pro Leu Glu Gly Ser Asp	225	230	235
Leu Trp Ser Leu Asn Lys Glu Asp Thr Ser Glu Gln Val Val Pro Val	245	250	255

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Leu Val Lys Asn Trp Lys Lys Glu Cys Ala Lys Thr Arg Lys Gln Pro  
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Val Lys Val Val Tyr Ser Ser Lys Asp Pro Ala Gln Pro Lys Glu Ser  
 275 280 285

Ser Lys Val Asp Ala Asn Glu Glu Val Glu Ala Leu Ile Val Lys Ser  
 290 295 300

Pro Gln Lys Glu Trp Asn Pro Ser Leu Phe Lys Val Leu Tyr Lys Thr  
 305 310 315 320

Phe Gly Pro Tyr Phe Leu Met Ser Phe Phe Phe Lys Ala Ile His Asp  
 325 330 335

Leu Met Met Phe Ser Gly Pro Gln Ile Leu Lys Leu Ile Lys Phe  
 340 345 350

Val Asn Asp Thr Lys Ala Pro Asp Trp Gln Gly Tyr Phe Tyr Thr Val  
 355 360 365

Leu Leu Phe Val Thr Ala Cys Leu Gln Thr Leu Val Leu His Gln Tyr  
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Phe His Ile Cys Phe Val Ser Gly Met Arg Ile Lys Thr Ala Val Ile  
 385 390 395 400

Gly Ala Val Tyr Arg Lys Ala Leu Val Ile Thr Asn Ser Ala Arg Lys  
 405 410 415

Ser Ser Thr Val Gly Glu Ile Val Asn Leu Met Ser Val Asp Ala Gln  
 420 425 430

Arg Phe Met Asp Leu Ala Thr Tyr Ile Asn Met Ile Trp Ser Ala Pro  
 435 440 445

Leu Gln Val Ile Leu Ala Leu Tyr Leu Leu Trp Leu Asn Leu Gly Pro  
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Ser Val Leu Ala Gly Val Ala Val Met Val Leu Met Val Pro Val Asn  
 465 470 475 480

Ala Val Met Ala Met Lys Thr Lys Thr Tyr Gln Val Ala His Met Lys  
 485 490 495

Ser Lys Asp Asn Arg Ile Lys Leu Met Asn Glu Ile Leu Asn Gly Ile  
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Lys Val Leu Lys Leu Tyr Ala Trp Glu Leu Ala Phe Lys Asp Lys Val  
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 Leu Ser Ala Val Gly Thr Phe Thr Trp Val Cys Thr Pro Phe Leu Val  
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 Ala Leu Cys Thr Phe Ala Val Tyr Val Thr Ile Asp Glu Asn Asn Ile  
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 Leu Asp Ala Gln Thr Ala Phe Val Ser Leu Ala Leu Phe Asn Ile Leu  
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 Arg Phe Pro Leu Asn Ile Leu Pro Met Val Ile Ser Ser Ile Val Gln  
 595 600 605  
 Ala Ser Val Ser Leu Lys Arg Leu Arg Ile Phe Leu Ser His Glu Glu  
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 Asp Pro Pro Thr Leu Asn Gly Ile Thr Phe Ser Ile Pro Glu Gly Ala  
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 690 695 700  
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 Tyr Arg Ser Val Ile Gln Ala Cys Ala Leu Leu Pro Asp Leu Glu Ile  
 740 745 750  
 Leu Pro Ser Gly Asp Arg Thr Glu Ile Gly Glu Lys Gly Val Asn Leu  
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 His Val Gly Lys His Ile Phe Glu Asn Val Ile Gly Pro Lys Gly Met  
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 Leu Lys Asn Lys Thr Arg Ile Leu Val Thr His Ser Met Ser Tyr Leu  
 820 825 830  
 Pro Gln Val Asp Val Ile Ile Val Met Ser Gly Gly Lys Ile Ser Glu  
 835 840 845  
 Met Gly Ser Tyr Gln Glu Leu Leu Ala Arg Asp Gly Ala Phe Ala Glu  
 850 855 860  
 Phe Leu Arg Thr Tyr Ala Ser Thr Glu Gln Glu Gln Asp Ala Glu Glu  
 865 870 875 880  
 Asn Gly Val Thr Gly Val Ser Gly Pro Gly Lys Glu Ala Lys Gln Met  
 885 890 895  
 Glu Asn Gly Met Leu Val Thr Asp Ser Ala Gly Lys Gln Leu Gln Arg  
 900 905 910  
 Gln Leu Ser Ser Ser Ser Ser Tyr Ser Gly Asp Ile Ser Arg His His  
 915 920 925  
 Asn Ser Thr Ala Glu Leu Gln Lys Ala Glu Ala Lys Lys Glu Glu Thr  
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 Trp Lys Leu Met Glu Ala Asp Lys Ala Gln Thr Gly Gln Val Lys Leu  
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 Ser Val Tyr Trp Asp Tyr Met Lys Ala Ile Gly Leu Phe Ile Ser Phe  
 965 970 975  
 Leu Ser Ile Phe Leu Phe Met Cys Asn His Val Ser Ala Leu Ala Ser  
 980 985 990  
 Asn Tyr Trp Leu Ser Leu Trp Thr Asp Asp Pro Ile Val Asn Gly Thr  
 995 1000 1005  
 Gln Glu His Thr Lys Val Arg Leu Ser Val Tyr Gly Ala Leu Gly  
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Ile Gly Gly Ile Leu Ala Ser Arg Cys Leu His Val Asp Leu Leu	1040	1045	1050
His Ser Ile Leu Arg Ser Pro Met Ser Phe Phe Glu Arg Thr Pro	1055	1060	1065
Ser Gly Asn Leu Val Asn Arg Phe Ser Lys Glu Leu Asp Thr Val	1070	1075	1080
Asp Ser Met Ile Pro Glu Val Ile Lys Met Phe Met Gly Ser Leu	1085	1090	1095
Phe Asn Val Ile Gly Ala Cys Ile Val Ile Leu Leu Ala Thr Pro	1100	1105	1110
Ile Ala Ala Ile Ile Ile Pro Pro Leu Gly Leu Ile Tyr Phe Phe	1115	1120	1125
Val Gln Arg Phe Tyr Val Ala Ser Ser Arg Gln Leu Lys Arg Leu	1130	1135	1140
Glu Ser Val Ser Arg Ser Pro Val Tyr Ser His Phe Asn Glu Thr	1145	1150	1155
Leu Leu Gly Val Ser Val Ile Arg Ala Phe Glu Glu Gln Glu Arg	1160	1165	1170
Phe Ile His Gln Ser Asp Leu Lys Val Asp Glu Asn Gln Lys Ala	1175	1180	1185
Tyr Tyr Pro Ser Ile Val Ala Asn Arg Trp Leu Ala Val Arg Leu	1190	1195	1200
Glu Cys Val Gly Asn Cys Ile Val Leu Phe Ala Ala Leu Phe Ala	1205	1210	1215
Val Ile Ser Arg His Ser Leu Ser Ala Gly Leu Val Gly Leu Ser	1220	1225	1230
Val Ser Tyr Ser Leu Gln Val Thr Thr Tyr Leu Asn Trp Leu Val	1235	1240	1245

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Gln Glu Thr Ala Pro Pro Ser Ser Trp Pro Gln Val Gly Arg Val  
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Glu Phe Arg Asn Tyr Cys Leu Arg Tyr Arg Glu Asp Leu Asp Phe  
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Val Leu Arg His Ile Asn Val Thr Ile Asn Gly Gly Glu Lys Val  
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Gly Ile Val Gly Arg Thr Gly Ala Gly Lys Ser Ser Leu Thr Leu  
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Gly Leu Phe Arg Ile Asn Glu Ser Ala Glu Gly Glu Ile Ile Ile  
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Asp Gly Ile Asn Ile Ala Lys Ile Gly Leu His Asp Leu Arg Phe  
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Lys Ile Thr Ile Ile Pro Gln Asp Pro Val Leu Phe Ser Gly Ser  
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Thr Gln Phe Glu Asp Cys Thr Val Leu Thr Ile Ala His Arg Leu  
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 Gly Gly Gly Gly Met Leu Ser Arg Lys Gly Ile Ile Pro Glu Glu  
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 Tyr Val Leu Thr Arg Leu Ala Glu Asp Pro Ala Glu Pro Arg Tyr  
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 Arg Thr Arg Glu Arg Arg Ala Arg Phe Val Ser Lys Lys Gly Asn  
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 Cys Asn Val Ala His Lys Asn Ile Arg Glu Gln Gly Arg Phe Leu  
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 Pro Gly Glu Gly Thr Asn Val Pro Cys Val Thr Ser Ile His Ser  
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 Gly Phe Gly Gly Arg Met Val Thr Glu Glu Cys Pro Leu Ala Ile  
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 1685 1690 1695  
 Ile Met Leu Gly Cys Ile Phe Met Lys Thr Ala Gln Ala His Arg  
 1700 1705 1710  
 Arg Ala Glu Thr Leu Ile Phe Ser Lys His Ala Val Ile Thr Leu  
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Arg His Gly Arg Leu Cys Phe Met Leu Arg Val Gly Asp Leu Arg  
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Lys Ser Met Ile Ile Ser Ala Thr Ile His Met Gln Val Val Arg  
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Lys Thr Thr Ser Pro Glu Gly Glu Val Val Pro Leu His Gln Val  
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Asp Ile Pro Met Glu Asn Gly Val Gly Gly Asn Gly Ile Phe Leu  
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Val Ala Pro Leu Ile Ile Tyr His Val Ile Asp Ser Asn Ser Pro  
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Leu Tyr Asp Leu Ala Pro Ser Asp Leu His His His Gln Asp Leu  
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Glu Ile Ile Val Ile Leu Glu Gly Val Val Glu Thr Thr Gly Ile  
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Thr Thr Gln Ala Arg Thr Ser Tyr Leu Ala Asp Glu Ile Leu Trp  
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 1850 1855 1860

Ser Val Asp Tyr Ser Lys Phe Gly Asn Thr Ile Lys Val Pro Thr  
 1865 1870 1875

Pro Leu Cys Thr Ala Arg Gln Leu Asp Glu Asp Arg Ser Leu Leu  
 1880 1885 1890

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Ser Val Ala Val Ala Lys Ala Lys Pro Lys Phe Ser Ile Ser Pro  
 1910 1915 1920

Asp Ser Leu Ser  
 1925

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Pro His Val Phe Leu Leu Phe Ile Thr Phe Pro Ile Leu Phe Ile Gly  
35 40 45  
Trp Gly Ser Gln Ser Ser Lys Val Gln Ile His His Asn Thr Trp Leu  
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His Phe Pro Gly His Asn Leu Arg Trp Ile Leu Thr Phe Ala Leu Leu  
65 70 75 80  
Phe Val His Val Cys Glu Ile Ala Glu Gly Ile Val Ser Asp Ser Gln  
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Arg Ala Ser Arg His Leu His Leu Phe Met Pro Ala Val Met Gly Phe  
100 105 110  
Val Ala Thr Thr Thr Ser Ile Val Tyr Tyr His Asn Ile Glu Thr Ser  
115 120 125  
Asn Phe Pro Lys Leu Leu Leu Ala Leu Phe Leu Tyr Trp Val Met Ala  
130 135 140  
Phe Ile Thr Lys Thr Ile Lys Leu Val Lys Tyr Trp Gln Leu Gly Trp  
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Gly Met Ser Asp Leu Arg Phe Cys Ile Thr Gly Val Met Val Ile Leu  
165 170 175  
Asn Gly Leu Leu Met Ala Val Glu Ile Asn Val Ile Arg Val Arg Arg  
180 185 190  
Tyr Val Phe Phe Met Asn Pro Gln Lys Val Lys Pro Pro Glu Asp Leu  
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Gln Asp Leu Gly Val Arg Phe Leu Gln Pro Phe Val Asn Leu Leu Ser  
210 215 220  
Lys Ala Thr Tyr Trp Trp Met Asn Thr Leu Ile Ile Ser Ala His Arg  
225 230 235 240  
Lys Pro Ile Asp Leu Lys Ala Ile Gly Lys Leu Pro Ile Ala Met Arg  
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245

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250

255

Ala Val Thr Asn Tyr Val Cys Leu Lys Glu Ala Tyr Glu Glu Gln Lys  
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Lys Lys Ala Ala Asp His Pro Asn Arg Thr Pro Ser Ile Trp Leu Ala  
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Met Tyr Arg Ala Phe Gly Arg Pro Ile Leu Leu Ser Ser Thr Phe Arg  
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Tyr Leu Ala Asp Leu Leu Gly Phe Ala Gly Pro Leu Cys Ile Ser Gly  
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Ile Val Gln Arg Val Asn Glu Pro Lys Asn Asn Thr Thr Arg Phe Ser  
325 330 335

Glu Thr Leu Ser Ser Lys Glu Phe Leu Glu Asn Ala His Val Leu Ala  
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Val Leu Leu Phe Leu Ala Leu Ile Leu Gln Arg Thr Phe Leu Gln Ala  
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Ser Tyr Tyr Val Thr Ile Glu Thr Gly Ile Asn Leu Arg Gly Ala Leu  
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Leu Ala Met Ile Tyr Asn Lys Ile Leu Arg Leu Ser Thr Ser Asn Leu  
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Ser Met Gly Glu Met Thr Leu Gly Gln Ile Asn Asn Leu Val Ala Ile  
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Glu Thr Asn Gln Leu Met Trp Phe Leu Phe Leu Cys Pro Asn Leu Trp  
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Ala Met Pro Val Gln Ile Ile Met Gly Val Ile Leu Leu Tyr Asn Leu  
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Leu Gly Ser Ser Ala Leu Val Gly Ala Ala Val Ile Val Leu Leu Ala  
450 455 460

Pro Ile Gln Tyr Phe Ile Ala Thr Lys Leu Ala Glu Ala Gln Lys Ser  
465 470 475 480

Thr Leu Asp Tyr Ser Thr Glu Arg Leu Lys Lys Thr Asn Glu Ile Leu  
485 490 495

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Lys Gly Ile Lys Leu Leu Lys Leu Tyr Ala Trp Glu His Ile Phe Cys  
500 505 510

Lys Ser Val Glu Glu Thr Arg Met Lys Glu Leu Ser Ser Leu Lys Thr  
515 520 525

Phe Ala Leu Tyr Thr Ser Leu Ser Ile Phe Met Asn Ala Ala Ile Pro  
530 535 540

Ile Ala Ala Val Leu Ala Thr Phe Val Thr His Ala Tyr Ala Ser Gly  
545 550 555 560

Asn Asn Leu Lys Pro Ala Glu Ala Phe Ala Ser Leu Ser Leu Phe His  
565 570 575

Ile Leu Val Thr Pro Leu Phe Leu Leu Ser Thr Val Val Arg Phe Ala  
580 585 590

Val Lys Ala Ile Ile Ser Val Gln Lys Leu Asn Glu Phe Leu Leu Ser  
595 600 605

Asp Glu Ile Gly Glu Asp Ser Trp Arg Thr Gly Glu Gly Thr Leu Pro  
610 615 620

Phe Glu Ser Cys Lys Lys His Thr Gly Val Gln Ser Lys Pro Ile Asn  
625 630 635 640

Arg Lys Gln Pro Gly Arg Tyr His Leu Asp Asn Tyr Glu Gln Ala Arg  
645 650 655

Arg Leu Arg Pro Ala Glu Thr Glu Asp Val Ala Ile Lys Val Thr Asn  
660 665 670

Gly Tyr Phe Ser Trp Gly Ser Gly Leu Ala Thr Leu Ser Asn Ile Asp  
675 680 685

Ile Arg Ile Pro Thr Gly Gln Leu Thr Met Ile Val Gly Gln Val Gly  
690 695 700

Cys Gly Lys Ser Ser Leu Leu Leu Ala Ile Leu Gly Glu Met Gln Thr  
705 710 715 720

Leu Glu Gly Lys Val Tyr Trp Asn Asn Val Asn Glu Ser Glu Pro Ser  
725 730 735

Phe Glu Ala Thr Arg Ser Arg Ser Arg Tyr Ser Val Ala Tyr Ala Ala  
740 745 750

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Gln Lys Pro Trp Leu Leu Asn Ala Thr Val Glu Glu Asn Ile Thr Phe  
755 760 765

Gly Ser Ser Phe Asn Arg Gln Arg Tyr Lys Ala Val Thr Asp Ala Cys  
770 775 780

Ser Leu Gln Pro Asp Ile Asp Leu Leu Pro Phe Gly Asp Gln Thr Glu  
785 790 795 800

Ile Gly Glu Arg Gly Ile Asn Leu Ser Gly Gly Gln Arg Gln Arg Ile  
805 810 815

Cys Val Ala Arg Ala Leu Tyr Gln Asn Thr Asn Ile Val Phe Leu Asp  
820 825 830

Asp Pro Phe Ser Ala Leu Asp Ile His Leu Ser Asp His Leu Met Gln  
835 840 845

Glu Gly Ile Leu Lys Phe Leu Gln Asp Asp Lys Arg Thr Val Val Leu  
850 855 860

Val Thr His Lys Leu Gln Tyr Leu Thr His Ala Asp Trp Ile Ile Ala  
865 870 875 880

Met Lys Asp Gly Ser Val Leu Arg Glu Gly Thr Leu Lys Asp Ile Gln  
885 890 895

Thr Lys Asp Val Glu Leu Tyr Glu His Trp Lys Thr Leu Met Asn Arg  
900 905 910

Gln Asp Gln Glu Leu Glu Lys Asp Met Glu Ala Asp Gln Thr Thr Leu  
915 920 925

Glu Arg Lys Thr Leu Arg Arg Ala Met Tyr Ser Arg Glu Ala Lys Ala  
930 935 940

Gln Met Glu Asp Glu Asp Glu Glu Glu Glu Glu Glu Asp Glu Asp  
945 950 955 960

Asp Asn Met Ser Thr Val Met Arg Leu Arg Thr Lys Met Pro Trp Lys  
965 970 975

Thr Cys Trp Trp Tyr Leu Thr Ser Gly Gly Phe Phe Leu Leu Phe Leu  
980 985 990

Met Ile Phe Ser Lys Leu Leu Lys His Ser Val Ile Val Ala Ile Asp  
995 1000 1005

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Tyr Trp Leu Ala Thr Trp Thr Ser Glu Tyr Ser Ile Asn Asp Pro  
 1010 1015 1020  
 Gly Lys Ala Asp Gln Thr Phe Tyr Val Ala Gly Phe Ser Ile Leu  
 1025 1030 1035  
 Cys Gly Ala Gly Ile Phe Leu Cys Leu Val Thr Ser Leu Thr Val  
 1040 1045 1050  
 Glu Trp Met Gly Leu Thr Ala Ala Lys Asn Leu His His Asn Leu  
 1055 1060 1065  
 Leu Asn Lys Ile Ile Leu Gly Pro Ile Arg Phe Phe Asp Thr Thr  
 1070 1075 1080  
 Pro Leu Gly Leu Ile Leu Asn Arg Phe Ser Ala Asp Thr Asn Ile  
 1085 1090 1095  
 Ile Asp Gln His Ile Pro Pro Thr Leu Glu Ser Leu Thr Arg Ser  
 1100 1105 1110  
 Thr Leu Leu Cys Leu Ser Ala Ile Gly Met Ile Ser Tyr Ala Thr  
 1115 1120 1125  
 Pro Val Phe Leu Ile Ala Leu Ala Pro Leu Gly Val Ala Phe Tyr  
 1130 1135 1140  
 Phe Ile Gln Lys Tyr Phe Arg Val Ala Ser Lys Asp Leu Gln Glu  
 1145 1150 1155  
 Leu Asp Asp Ser Thr Gln Leu Pro Leu Leu Cys His Phe Ser Glu  
 1160 1165 1170  
 Thr Ala Glu Gly Leu Thr Thr Ile Arg Ala Phe Arg His Glu Thr  
 1175 1180 1185  
 Arg Phe Lys Gln Arg Met Leu Glu Leu Thr Asp Thr Asn Asn Ile  
 1190 1195 1200  
 Ala Tyr Leu Phe Leu Ser Ala Ala Asn Arg Trp Leu Glu Val Arg  
 1205 1210 1215  
 Thr Asp Tyr Leu Gly Ala Cys Ile Val Leu Thr Ala Ser Ile Ala  
 1220 1225  
 Ser Ile Ser Gly Ser Ser Asn Ser Gly Leu Val Gly Leu Gly Leu  
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1235					1240					s263US104.ST25 1245				
Leu Tyr 1250	Ala	Leu	Thr	Ile Thr 1255	Asn	Tyr	Leu	Asn Trp 1260	Val	Val	Arg			
Asn Leu 1265	Ala	Asp	Leu	Glu Val 1270	Gln	Met	Gly	Ala Val 1275	Lys	Lys	Val			
Asn Ser 1280	Phe	Leu	Thr	Met Glu 1285	Ser	Glu	Asn	Tyr Glu 1290	Gly	Thr	Met			
Asp Pro 1295	Ser	Gln	Val	Pro Glu 1300	His	Trp	Pro	Gln Glu 1305	Gly	Glu	Ile			
Lys Ile 1310	His	Asp	Leu	Cys Val 1315	Arg	Tyr	Glu	Asn Asn 1320	Leu	Lys	Pro			
Val Leu 1325	Lys	His	Val	Lys Ala 1330	Tyr	Ile	Lys	Pro Gly 1335	Gln	Lys	Val			
Gly Ile 1340	Cys	Gly	Arg	Thr Gly 1345	Ser	Gly	Lys	Ser Ser 1350	Leu	Ser	Leu			
Ala Phe 1355	Phe	Arg	Met	Val Asp 1360	Ile	Phe	Asp	Gly Lys 1365	Ile	Val	Ile			
Asp Gly 1370	Ile	Asp	Ile	Ser Lys 1375	Leu	Pro	Leu	His Thr 1380	Leu	Arg	Ser			
Arg Leu 1385	Ser	Ile	Ile	Leu Gln 1390	Asp	Pro	Ile	Leu Phe 1395	Ser	Gly	Ser			
Ile Arg 1400	Phe	Asn	Leu	Asp Pro 1405	Glu	Cys	Lys	Cys Thr 1410	Asp	Asp	Arg			
Leu Trp 1415	Glu	Ala	Leu	Glu Ile 1420	Ala	Gln	Leu	Lys Asn 1425	Met	Val	Lys			
Ser Leu 1430	Pro	Gly	Gly	Leu Asp 1435	Ala	Thr	Val	Thr Glu 1440	Gly	Gly	Glu			
Asn Phe 1445	Ser	Val	Gly	Gln Arg 1450	Gln	Leu	Phe	Cys Leu 1455	Ala	Arg	Ala			
Phe Val 1460	Arg	Lys	Ser	Ser Ile 1465	Leu	Ile	Met	Asp Glu 1470	Ala	Thr	Ala			

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Ser	Ile	Asp	Met	Ala	Thr	Glu	Asn	Ile	Leu	Gln	Lys	Val	Val	Met
1475						1480					1485			
Thr	Ala	Phe	Ala	Asp	Arg	Thr	Val	Val	Thr	Ile	Ala	His	Arg	Val
1490						1495					1500			
Ser	Ser	Ile	Met	Asp	Ala	Gly	Leu	Val	Leu	Val	Phe	Ser	Glu	Gly
1505						1510					1515			
Ile	Leu	Val	Glu	Cys	Asp	Thr	Gly	Pro	Asn	Leu	Leu	Gln	His	Lys
1520						1525					1530			
Asn	Gly	Leu	Phe	Ser	Thr	Leu	Val	Met	Thr	Asn	Lys	Gly	Gly	Gly
1535						1540					1545			
Gly	Gly	Gly	Met	Leu	Ser	Arg	Lys	Gly	Ile	Ile	Pro	Glu	Glu	Tyr
1550						1555					1560			
Val	Leu	Thr	Arg	Leu	Ala	Glu	Asp	Pro	Ala	Glu	Pro	Arg	Tyr	Arg
1565						1570					1575			
Thr	Arg	Glu	Arg	Arg	Ala	Arg	Phe	Val	Ser	Lys	Lys	Gly	Asn	Cys
1580						1585					1590			
Asn	Val	Ala	His	Lys	Asn	Ile	Arg	Glu	Gln	Gly	Arg	Phe	Leu	Gln
1595						1600					1605			
Asp	Val	Phe	Thr	Thr	Leu	Val	Asp	Leu	Lys	Trp	Pro	His	Thr	Leu
1610						1615					1620			
Leu	Ile	Phe	Thr	Met	Ser	Phe	Leu	Cys	Ser	Trp	Leu	Leu	Phe	Ala
1625						1630					1635			
Met	Val	Trp	Trp	Leu	Ile	Ala	Phe	Ala	His	Gly	Asp	Leu	Tyr	Ala
1640						1645					1650			
Tyr	Met	Glu	Lys	Gly	Ile	Thr	Asp	Leu	Ala	Pro	Tyr	Pro	Tyr	Asp
1655						1660					1665			
Val	Pro	Asp	Tyr	Ala	Gly	Glu	Gly	Thr	Asn	Val	Pro	Cys	Val	Thr
1670						1675					1680			
Ser	Ile	His	Ser	Phe	Ser	Ser	Ala	Phe	Leu	Phe	Ser	Ile	Glu	Val
1685						1690					1695			
Gln	Val	Thr	Ile	Gly	Phe	Gly	Gly	Arg	Met	Val	Thr	Glu	Glu	Cys
1700						1705					1710			

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Pro Leu Ala Ile Leu Ile Leu Ile Val Gln Asn Ile Val Gly Leu  
 1715 1720  
 Met Ile Asn Ala Ile Met Leu Gly Cys Ile Phe Met Lys Thr Ala  
 1730 1735 1740  
 Gln Ala His Arg Arg Ala Glu Thr Leu Ile Phe Ser Lys His Ala  
 1745 1750 1755  
 Val Ile Thr Leu Arg His Gly Arg Leu Cys Phe Met Leu Arg Val  
 1760 1765 1770  
 Gly Asp Leu Arg Lys Ser Met Ile Ile Ser Ala Thr Ile His Met  
 1775 1780 1785  
 Gln Val Val Arg Lys Thr Thr Ser Pro Glu Gly Glu Val Val Pro  
 1790 1795 1800  
 Leu His Gln Val Asp Ile Pro Met Glu Asn Gly Val Gly Gly Asn  
 1805 1810 1815  
 Gly Ile Phe Leu Val Ala Pro Leu Ile Ile Tyr His Val Ile Asp  
 1820 1825 1830  
 Ser Asn Ser Pro Leu Tyr Asp Leu Ala Pro Ser Asp Leu His His  
 1835 1840 1845  
 His Gln Asp Leu Glu Ile Ile Val Ile Leu Glu Gly Val Val Glu  
 1850 1855 1860  
 Thr Thr Gly Ile Thr Thr Gln Ala Arg Thr Ser Tyr Leu Ala Asp  
 1865 1870 1875  
 Glu Ile Leu Trp Gly Gln Arg Phe Val Pro Ile Val Ala Glu Glu  
 1880 1885 1890  
 Asp Gly Arg Tyr Ser Val Asp Tyr Ser Lys Phe Gly Asn Thr Ile  
 1895 1900 1905  
 Lys Val Pro Thr Pro Leu Cys Thr Ala Arg Gln Leu Asp Glu Asp  
 1910 1915 1920  
 Arg Ser Leu Leu Asp Ala Leu Thr Leu Ala Ser Ser Arg Gly Pro  
 1925 1930 1935  
 Leu Arg Lys Arg Ser Val Ala Val Ala Lys Ala Lys Pro Lys Phe  
 1940 1945 1950



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Ser Ile Ser Pro Asp Ser Leu Ser  
1955 1960

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<212> PRT  
<213> Homo sapiens

<400> 8

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Asp Trp Asn Val Thr Trp Asn Thr Ser Asn Pro Asp Phe Thr Lys Cys  
20 25 30

Phe Gln Asn Thr Val Leu Val Trp Val Pro Cys Phe Tyr Leu Trp Ala  
35 40 45

Cys Phe Pro Phe Tyr Phe Leu Tyr Leu Ser Arg His Asp Arg Gly Tyr  
50 55 60

Ile Gln Met Thr Pro Leu Asn Lys Thr Lys Thr Ala Leu Gly Phe Leu  
65 70 75 80

Leu Trp Ile Val Cys Trp Ala Asp Leu Phe Tyr Ser Phe Trp Glu Arg  
85 90 95

Ser Arg Gly Ile Phe Leu Ala Pro Val Phe Leu Val Ser Pro Thr Leu  
100 105 110

Leu Gly Ile Thr Thr Leu Leu Ala Thr Phe Leu Ile Gln Leu Glu Arg  
115 120 125

Arg Lys Gly Val Gln Ser Ser Gly Ile Met Leu Thr Phe Trp Leu Val  
130 135 140

Ala Leu Val Cys Ala Leu Ala Ile Leu Arg Ser Lys Ile Met Thr Ala  
145 150 155 160

Leu Lys Glu Asp Ala Gln Val Asp Leu Phe Arg Asp Ile Thr Phe Tyr  
165 170 175

Val Tyr Phe Ser Leu Leu Leu Ile Gln Leu Val Leu Ser Cys Phe Ser  
180 185 190

Asp Arg Ser Pro Leu Phe Ser Glu Thr Ile His Asp Pro Asn Pro Cys  
195 200 205

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Pro Glu Ser Ser Ala Ser Phe Leu Ser Arg Ile Thr Phe Trp Trp Ile  
 210 215

Thr Gly Leu Ile Val Arg Gly Tyr Arg Gln Pro Leu Glu Gly Ser Asp  
 225 230 235 240

Leu Trp Ser Leu Asn Lys Glu Asp Thr Ser Glu Gln Val Val Pro Val  
 245 250 255

Leu Val Lys Asn Trp Lys Lys Glu Cys Ala Lys Thr Arg Lys Gln Pro  
 260 265 270

Val Lys Val Val Tyr Ser Ser Lys Asp Pro Ala Gln Pro Lys Glu Ser  
 275 280 285

Ser Lys Val Asp Ala Asn Glu Glu Val Glu Ala Leu Ile Val Lys Ser  
 290 295 300

Pro Gln Lys Glu Trp Asn Pro Ser Leu Phe Lys Val Leu Tyr Lys Thr  
 305 310 315 320

Phe Gly Pro Tyr Phe Leu Met Ser Phe Phe Phe Lys Ala Ile His Asp  
 325 330 335

Leu Met Met Phe Ser Gly Pro Gln Ile Leu Lys Leu Leu Ile Lys Phe  
 340 345 350

Val Asn Asp Thr Lys Ala Pro Asp Trp Gln Gly Tyr Phe Tyr Thr Val  
 355 360 365

Leu Leu Phe Val Thr Ala Cys Leu Gln Thr Leu Val Leu His Gln Tyr  
 370 375 380

Phe His Ile Cys Phe Val Ser Gly Met Arg Ile Lys Thr Ala Val Ile  
 385 390 395 400

Gly Ala Val Tyr Arg Lys Ala Leu Val Ile Thr Asn Ser Ala Arg Lys  
 405 410 415

Ser Ser Thr Val Gly Glu Ile Val Asn Leu Met Ser Val Asp Ala Gln  
 420 425 430

Arg Phe Met Asp Leu Ala Thr Tyr Ile Asn Met Ile Trp Ser Ala Pro  
 435 440 445

Leu Gln Val Ile Leu Ala Leu Tyr Leu Leu Trp Leu Asn Leu Gly Pro  
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460

450

455

Ser Val Leu Ala Gly Val Ala Val Met Val Leu Met Val Pro Val Asn  
465 470 475 480

Ala Val Met Ala Met Lys Thr Lys Thr Tyr Gln Val Ala His Met Lys  
485 490 495

Ser Lys Asp Asn Arg Ile Lys Leu Met Asn Glu Ile Leu Asn Gly Ile  
500 505 510

Lys Val Leu Lys Leu Tyr Ala Trp Glu Leu Ala Phe Lys Asp Lys Val  
515 520 525

Leu Ala Ile Arg Gln Glu Glu Leu Lys Val Leu Lys Lys Ser Ala Tyr  
530 535 540

Leu Ser Ala Val Gly Thr Phe Thr Trp Val Cys Thr Pro Phe Leu Val  
545 550 555 560

Ala Leu Cys Thr Phe Ala Val Tyr Val Thr Ile Asp Glu Asn Asn Ile  
565 570 575

Leu Asp Ala Gln Thr Ala Phe Val Ser Leu Ala Leu Phe Asn Ile Leu  
580 585 590

Arg Phe Pro Leu Asn Ile Leu Pro Met Val Ile Ser Ser Ile Val Gln  
595 600 605

Ala Ser Val Ser Leu Lys Arg Leu Arg Ile Phe Leu Ser His Glu Glu  
610 615 620

Leu Glu Pro Asp Ser Ile Glu Arg Arg Pro Val Lys Asp Gly Gly Gly  
625 630 635 640

Thr Asn Ser Ile Thr Val Arg Asn Ala Thr Phe Thr Trp Ala Arg Ser  
645 650 655

Asp Pro Pro Thr Leu Asn Gly Ile Thr Phe Ser Ile Pro Glu Gly Ala  
660 665 670

Leu Val Ala Val Val Gly Gln Val Gly Cys Gly Lys Ser Ser Leu Leu  
675 680 685

Ser Ala Leu Leu Ala Glu Met Asp Lys Val Glu Gly His Val Ala Ile  
690 695 700

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Lys Gly Ser Val Ala Tyr Val Pro Gln Gln Ala Trp Ile Gln Asn Asp  
 705 710 715 720  
 Ser Leu Arg Glu Asn Ile Leu Phe Gly Cys Gln Leu Glu Glu Pro Tyr  
 725 730 735  
 Tyr Arg Ser Val Ile Gln Ala Cys Ala Leu Leu Pro Asp Leu Glu Ile  
 740 745 750  
 Leu Pro Ser Gly Asp Arg Thr Glu Ile Gly Glu Lys Gly Val Asn Leu  
 755 760 765  
 Ser Gly Gln Gln Lys Gln Arg Val Ser Leu Ala Arg Ala Val Tyr Ser  
 770 775 780  
 Asn Ala Asp Ile Tyr Leu Phe Asp Asp Pro Leu Ser Ala Val Asp Ala  
 785 790 795 800  
 His Val Gly Lys His Ile Phe Glu Asn Val Ile Gly Pro Lys Gly Met  
 805 810 815  
 Leu Lys Asn Lys Thr Arg Ile Leu Val Thr His Ser Met Ser Tyr Leu  
 820 825 830  
 Pro Gln Val Asp Val Ile Ile Val Met Ser Gly Gly Lys Ile Ser Glu  
 835 840 845  
 Met Gly Ser Tyr Gln Glu Leu Leu Ala Arg Asp Gly Ala Phe Ala Glu  
 850 855 860  
 Phe Leu Arg Thr Tyr Ala Ser Thr Glu Gln Glu Gln Asp Ala Glu Glu  
 865 870 875 880  
 Asn Gly Val Thr Gly Val Ser Gly Pro Gly Lys Glu Ala Lys Gln Met  
 885 890 895  
 Glu Asn Gly Met Leu Val Thr Asp Ser Ala Gly Lys Gln Leu Gln Arg  
 900 905 910  
 Gln Leu Ser Ser Ser Ser Tyr Ser Gly Asp Ile Ser Arg His His  
 915 920 925  
 Asn Ser Thr Ala Glu Leu Gln Lys Ala Glu Ala Lys Lys Glu Glu Thr  
 930 935 940  
 Trp Lys Leu Met Glu Ala Asp Lys Ala Gln Thr Gly Gln Val Lys Leu  
 945 950 955 960

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Ser Val Tyr Trp Asp Tyr Met Lys Ala Ile Gly Leu Phe Ile Ser Phe  
965 970

Leu Ser Ile Phe Leu Phe Met Cys Asn His Val Ser Ala Leu Ala Ser  
980 985 990

Asn Tyr Trp Leu Ser Leu Trp Thr Asp Asp Pro Ile Val Asn Gly Thr  
995 1000 1005

Gln Glu His Thr Lys Val Arg Leu Ser Val Tyr Gly Ala Leu Gly  
1010 1015 1020

Ile Ser Gln Gly Ile Ala Val Phe Gly Tyr Ser Met Ala Val Ser  
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Ile Gly Gly Ile Leu Ala Ser Arg Cys Leu His Val Asp Leu Leu  
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His Ser Ile Leu Arg Ser Pro Met Ser Phe Phe Glu Arg Thr Pro  
1055 1060 1065

Ser Gly Asn Leu Val Asn Arg Phe Ser Lys Glu Leu Asp Thr Val  
1070 1075 1080

Asp Ser Met Ile Pro Glu Val Ile Lys Met Phe Met Gly Ser Leu  
1085 1090 1095

Phe Asn Val Ile Gly Ala Cys Ile Val Ile Leu Leu Ala Thr Pro  
1100 1105 1110

Ile Ala Ala Ile Ile Ile Pro Pro Leu Gly Leu Ile Tyr Phe Phe  
1115 1120 1125

Val Gln Arg Phe Tyr Val Ala Ser Ser Arg Gln Leu Lys Arg Leu  
1130 1135 1140

Glu Ser Val Ser Arg Ser Pro Val Tyr Ser His Phe Asn Glu Thr  
1145 1150 1155

Leu Leu Gly Val Ser Val Ile Arg Ala Phe Glu Glu Gln Glu Arg  
1160 1165 1170

Phe Ile His Gln Ser Asp Leu Lys Val Asp Glu Asn Gln Lys Ala  
1175 1180 1185

Tyr Tyr Pro Ser Ile Val Ala Asn Arg Trp Leu Ala Val Arg Leu  
1190 1195 1200

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Glu Cys Val Gly Asn Cys Ile Val Leu Phe Ala Ala Leu Phe Ala  
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 Val Ile Ser Arg His Ser Leu Ser Ala Gly Leu Val Gly Leu Ser  
 1220 1225 1230  
 Val Ser Tyr Ser Leu Gln Val Thr Thr Tyr Leu Asn Trp Leu Val  
 1235 1240 1245  
 Arg Met Ser Ser Glu Met Glu Thr Asn Ile Val Val Glu Arg  
 1250 1255 1260  
 Leu Lys Glu Tyr Ser Glu Thr Glu Lys Glu Ala Pro Trp Gln Ile  
 1265 1270 1275  
 Gln Glu Thr Ala Pro Pro Ser Ser Trp Pro Gln Val Gly Arg Val  
 1280 1285 1290  
 Glu Phe Arg Asn Tyr Cys Leu Arg Tyr Arg Glu Asp Leu Asp Phe  
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 Gly Leu Phe Arg Ile Asn Glu Ser Ala Glu Gly Glu Ile Ile Ile  
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 Asp Gly Ile Asn Ile Ala Lys Ile Gly Leu His Asp Leu Arg Phe  
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 Lys Ile Thr Ile Ile Pro Gln Asp Pro Val Leu Phe Ser Gly Ser  
 1370 1375 1380  
 Leu Arg Met Asn Leu Asp Pro Phe Ser Gln Tyr Ser Asp Glu Glu  
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 Val Trp Thr Ser Leu Glu Leu Ala His Leu Lys Asp Phe Val Ser  
 1400 1405 1410  
 Ala Leu Pro Asp Lys Leu Asp His Glu Cys Ala Glu Gly Gly Glu  
 1415 1420 1425  
 Asn Leu Ser Val Gly Gln Arg Gln Leu Val Cys Leu Ala Arg Ala  
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1430

1435

Leu	Leu	Arg	Lys	Thr	Lys	Ile	Leu	Val	Leu	Asp	Glu	Ala	Thr	Ala
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Ala	Val	Asp	Leu	Glu	Thr	Asp	Asp	Leu	Ile	Gln	Ser	Thr	Ile	Arg
1460						1465					1470			
Thr	Gln	Phe	Glu	Asp	Cys	Thr	Val	Leu	Thr	Ile	Ala	His	Arg	Leu
1475						1480					1485			
Asn	Thr	Ile	Met	Asp	Tyr	Thr	Arg	Val	Ile	Val	Leu	Asp	Lys	Gly
1490						1495					1500			
Glu	Ile	Gln	Glu	Tyr	Gly	Ala	Pro	Ser	Asp	Leu	Leu	Gln	Gln	Arg
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Gly	Leu	Phe	Tyr	Ser	Met	Ala	Lys	Asp	Ala	Gly	Leu	Val	Gly	Gly
1520						1525					1530			
Gly	Gly	Gly	Gly	Met	Leu	Ser	Arg	Lys	Gly	Ile	Ile	Pro	Glu	Glu
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Tyr	Val	Leu	Thr	Arg	Leu	Ala	Glu	Asp	Pro	Ala	Glu	Pro	Arg	Tyr
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Arg	Thr	Arg	Glu	Arg	Arg	Ala	Arg	Phe	Val	Ser	Lys	Lys	Gly	Asn
1565						1570					1575			
Cys	Asn	Val	Ala	His	Lys	Asn	Ile	Arg	Glu	Gln	Gly	Arg	Phe	Leu
1580						1585					1590			
Gln	Asp	Val	Phe	Thr	Thr	Leu	Val	Asp	Leu	Lys	Trp	Pro	His	Thr
1595						1600					1605			
Leu	Leu	Ile	Phe	Thr	Met	Ser	Phe	Leu	Cys	Ser	Trp	Leu	Leu	Phe
1610						1615					1620			
Ala	Met	Val	Trp	Trp	Leu	Ile	Ala	Phe	Ala	His	Gly	Asp	Leu	Tyr
1625						1630					1635			
Ala	Tyr	Met	Glu	Lys	Gly	Ile	Thr	Asp	Leu	Ala	Pro	Tyr	Pro	Tyr
1640						1645					1650			
Asp	Val	Pro	Asp	Tyr	Ala	Gly	Glu	Gly	Thr	Asn	Val	Pro	Cys	Val
1655						1660					1665			

Thr	Ser	Ile	His	Ser	Phe	Ser	Ser	Ala	Phe	Leu	Phe	Ser	Ile	Glu
1670						1675					1680			
Val	Gln	Val	Thr	Ile	Gly	Phe	Gly	Gly	Arg	Met	Val	Thr	Glu	Glu
1685						1690					1695			
Cys	Pro	Leu	Ala	Ile	Leu	Ile	Leu	Ile	Val	Gln	Asn	Ile	Val	Gly
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1715						1720					1725			
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1730						1735					1740			
Ala	Val	Ile	Thr	Leu	Arg	His	Gly	Arg	Leu	Cys	Phe	Met	Leu	Arg
1745						1750					1755			
Val	Gly	Asp	Leu	Arg	Lys	Ser	Met	Ile	Ile	Ser	Ala	Thr	Ile	His
1760						1765					1770			
Met	Gln	Val	Val	Arg	Lys	Thr	Thr	Ser	Pro	Glu	Gly	Glu	Val	Val
1775						1780					1785			
Pro	Leu	His	Gln	Val	Asp	Ile	Pro	Met	Glu	Asn	Gly	Val	Gly	Gly
1790						1795					1800			
Asn	Gly	Ile	Phe	Leu	Val	Ala	Pro	Leu	Ile	Ile	Tyr	His	Val	Ile
1805						1810					1815			
Asp	Ser	Asn	Ser	Pro	Leu	Tyr	Asp	Leu	Ala	Pro	Ser	Asp	Leu	His
1820						1825					1830			
His	His	Gln	Asp	Leu	Glu	Ile	Ile	Val	Ile	Leu	Glu	Gly	Val	Val
1835						1840					1845			
Glu	Thr	Thr	Gly	Ile	Thr	Thr	Gln	Ala	Arg	Thr	Ser	Tyr	Leu	Ala
1850						1855					1860			
Asp	Glu	Ile	Leu	Trp	Gly	Gln	Arg	Phe	Val	Pro	Ile	Val	Ala	Glu
1865						1870					1875			
Glu	Asp	Gly	Arg	Tyr	Ser	Val	Asp	Tyr	Ser	Lys	Phe	Gly	Asn	Thr
1880						1885					1890			
Ile	Lys	Val	Pro	Thr	Pro	Leu	Cys	Thr	Ala	Arg	Gln	Leu	Asp	Glu
1895						1900					1905			



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Asp Arg Ser Leu Leu Asp Ala Leu Thr Leu Ala Ser Ser Arg Gly  
1910 1915 1920

Pro Leu Arg Lys Arg Ser Val Ala Val Ala Lys Ala Lys Pro Lys  
1925 1930 1935

Phe Ser Ile Ser Pro Asp Ser Leu Ser  
1940 1945

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<211> 1895

<212> PRT

<213> Saccharomyces cerevisiae

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Met Ala Gly Asn Leu Val Ser Trp Ala Cys Lys Leu Cys Arg Ser Pro  
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Glu Gly Phe Gly Pro Ile Ser Phe Tyr Gly Asp Phe Thr Gln Cys Phe  
20 25 30

Ile Asp Gly Val Ile Leu Asn Leu Ser Ala Ile Phe Met Ile Thr Phe  
35 40 45

Gly Ile Arg Asp Leu Val Asn Leu Cys Lys Lys Lys His Ser Gly Ile  
50 55 60

Lys Tyr Arg Arg Asn Trp Ile Ile Val Ser Arg Met Ala Leu Val Leu  
65 70 75 80

Leu Glu Ile Ala Phe Val Ser Leu Ala Ser Leu Asn Ile Ser Lys Glu  
85 90 95

Glu Ala Glu Asn Phe Thr Ile Val Ser Gln Tyr Ala Ser Thr Met Leu  
100 105 110

Ser Leu Phe Val Ala Leu Ala Leu His Trp Ile Glu Tyr Asp Arg Ser  
115 120 125

Val Val Ala Asn Thr Val Leu Leu Phe Tyr Trp Leu Phe Glu Thr Phe  
130 135 140

Gly Asn Phe Ala Lys Leu Ile Asn Ile Leu Ile Arg His Thr Tyr Glu  
145 150 155 160

Gly Ile Trp Tyr Ser Gly Gln Thr Gly Phe Ile Leu Thr Leu Phe Gln  
165 170 175

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Val Ile Thr Cys Ala Ser Ile Leu Leu Leu Glu Ala Leu Pro Lys Lys  
 180 185 190  
 Pro Leu Met Pro His Gln His Ile His Gln Thr Leu Thr Arg Arg Lys  
 195 200 205  
 Pro Asn Pro Tyr Asp Ser Ala Asn Ile Phe Ser Arg Ile Thr Phe Ser  
 210 215 220  
 Trp Met Ser Gly Leu Met Lys Thr Gly Tyr Glu Lys Tyr Leu Val Glu  
 225 230 235 240  
 Ala Asp Leu Tyr Lys Leu Pro Arg Asn Phe Ser Ser Glu Glu Leu Ser  
 245 250 255  
 Gln Lys Leu Glu Lys Asn Trp Glu Asn Glu Leu Lys Gln Lys Ser Asn  
 260 265 270  
 Pro Ser Leu Ser Trp Ala Ile Cys Arg Thr Phe Gly Ser Lys Met Leu  
 275 280 285  
 Leu Ala Ala Phe Phe Lys Ala Ile His Asp Val Leu Ala Phe Thr Gln  
 290 295 300  
 Pro Gln Leu Leu Arg Ile Leu Ile Lys Phe Val Thr Asp Tyr Asn Ser  
 305 310 315 320  
 Glu Arg Gln Asp Asp His Ser Ser Leu Gln Gly Phe Glu Asn Asn His  
 325 330 335  
 Pro Gln Lys Leu Pro Ile Val Arg Gly Phe Leu Ile Ala Phe Ala Met  
 340 345 350  
 Phe Leu Val Gly Phe Thr Gln Thr Ser Val Leu His Gln Tyr Phe Leu  
 355 360 365  
 Asn Val Phe Asn Thr Gly Met Tyr Ile Lys Ser Ala Leu Thr Ala Leu  
 370 375 380  
 Ile Tyr Gln Lys Ser Leu Val Leu Ser Asn Glu Ala Ser Gly Leu Ser  
 385 390 395 400  
 Ser Thr Gly Asp Ile Val Asn Leu Met Ser Val Asp Val Gln Lys Leu  
 405 410 415  
 Gln Asp Leu Thr Gln Trp Leu Asn Leu Ile Trp Ser Gly Pro Phe Gln  
 420 425 430

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Ile Ile Ile Cys Leu Tyr Ser Leu Tyr Lys Leu Leu Gly Asn Ser Met  
435 440 445

Trp Val Gly Val Ile Ile Leu Val Ile Met Met Pro Leu Asn Ser Phe  
450 455 460

Leu Met Arg Ile Gln Lys Lys Leu Gln Lys Ser Gln Met Lys Tyr Lys  
465 470 475 480

Asp Glu Arg Thr Arg Val Ile Ser Glu Ile Leu Asn Asn Ile Lys Ser  
485 490 495

Leu Lys Leu Tyr Ala Trp Glu Lys Pro Tyr Arg Glu Lys Leu Glu Glu  
500 505 510

Val Arg Asn Asn Lys Glu Leu Lys Asn Leu Thr Lys Leu Gly Cys Tyr  
515 520 525

Met Ala Val Thr Ser Phe Gln Phe Asn Ile Val Pro Phe Leu Val Ser  
530 535 540

Cys Cys Thr Phe Ala Val Phe Val Tyr Thr Glu Asp Arg Ala Leu Thr  
545 550 555 560

Thr Asp Leu Val Phe Pro Ala Leu Thr Leu Phe Asn Leu Leu Ser Phe  
565 570 575

Pro Leu Met Ile Ile Pro Met Val Leu Asn Ser Phe Ile Glu Ala Ser  
580 585 590

Val Ser Ile Gly Arg Leu Phe Thr Phe Phe Thr Asn Glu Glu Leu Gln  
595 600 605

Pro Asp Ser Val Gln Arg Leu Pro Lys Val Lys Asn Ile Gly Asp Val  
610 615 620

Ala Ile Asn Ile Gly Asp Asp Ala Thr Phe Leu Trp Gln Arg Lys Pro  
625 630 635 640

Glu Tyr Lys Val Ala Leu Lys Asn Ile Asn Phe Gln Ala Lys Lys Gly  
645 650 655

Asn Leu Thr Cys Ile Val Gly Lys Val Gly Ser Gly Lys Thr Ala Leu  
660 665 670

Leu Ser Cys Met Leu Gly Asp Arg Phe Arg Val Lys Gly Phe Ala Thr  
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675

680

685

Val His Gly Ser Val Ala Tyr Val Ser Gln Val Pro Trp Ile Met Asn  
 690 695 700  
 Gly Thr Val Lys Glu Asn Ile Leu Phe Gly His Arg Tyr Asp Ala Glu  
 705 710 715 720  
 Phe Tyr Glu Lys Thr Ile Lys Ala Cys Ala Leu Thr Ile Asp Leu Ala  
 725 730 735  
 Ile Leu Met Asp Gly Asp Lys Thr Leu Val Gly Glu Lys Gly Ile Ser  
 740 745 750  
 Leu Ser Gly Gly Gln Lys Ala Arg Leu Ser Leu Ala Arg Ala Val Tyr  
 755 760 765  
 Ala Arg Ala Asp Thr Tyr Leu Leu Asp Asp Pro Leu Ala Ala Val Asp  
 770 775 780  
 Glu His Val Ala Arg His Leu Ile Glu His Val Leu Gly Pro Asn Gly  
 785 790 795 800  
 Leu Leu His Thr Lys Thr Lys Val Leu Ala Thr Asn Lys Val Ser Ala  
 805 810 815  
 Leu Ser Ile Ala Asp Ser Ile Ala Leu Leu Asp Asn Gly Glu Ile Thr  
 820 825 830  
 Gln Gln Gly Thr Tyr Asp Glu Ile Thr Lys Asp Ala Asp Ser Pro Leu  
 835 840 845  
 Trp Lys Leu Leu Asn Asn Tyr Gly Lys Lys Asn Asn Gly Lys Ser Asn  
 850 855 860  
 Glu Phe Gly Asp Ser Ser Glu Ser Ser Val Arg Glu Ser Ser Ile Pro  
 865 870 875 880  
 Val Glu Gly Glu Leu Glu Gln Leu Gln Lys Leu Asn Asp Leu Asp Phe  
 885 890 895  
 Gly Asn Ser Asp Ala Ile Ser Leu Arg Arg Ala Ser Asp Ala Thr Leu  
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 Gly Ser Ile Asp Phe Gly Asp Asp Glu Asn Ile Ala Lys Arg Glu His  
 915 920 925

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Arg Glu Gln Gly Lys Val Lys Trp Asn Ile Tyr Leu Glu Tyr Ala Lys  
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Ala Cys Asn Pro Lys Ser Val Cys Val Phe Ile Leu Phe Ile Val Ile  
 945 950 955 960

Ser Met Phe Leu Ser Val Met Gly Asn Val Trp Leu Lys His Trp Ser  
 965 970 975

Glu Val Asn Ser Arg Tyr Gly Ser Asn Pro Asn Ala Ala Arg Tyr Leu  
 980 985 990

Ala Ile Tyr Phe Ala Leu Gly Ile Gly Ser Ala Leu Ala Thr Leu Ile  
 995 1000 1005

Gln Thr Ile Val Leu Trp Val Phe Cys Thr Ile His Ala Ser Lys  
 1010 1015 1020

Tyr Leu His Asn Leu Met Thr Asn Ser Val Leu Arg Ala Pro Met  
 1025 1030 1035

Thr Phe Phe Glu Thr Thr Pro Ile Gly Arg Ile Leu Asn Arg Phe  
 1040 1045 1050

Ser Asn Asp Ile Tyr Lys Val Asp Ala Leu Leu Gly Arg Thr Phe  
 1055 1060 1065

Ser Gln Phe Phe Val Asn Ala Val Lys Val Thr Phe Thr Ile Thr  
 1070 1075 1080

Val Ile Cys Ala Thr Thr Trp Gln Phe Ile Phe Ile Ile Pro  
 1085 1090 1095

Leu Ser Val Phe Tyr Ile Tyr Tyr Gln Gln Tyr Tyr Leu Arg Thr  
 1100 1105 1110

Ser Arg Glu Leu Arg Arg Leu Asp Ser Ile Thr Arg Ser Pro Ile  
 1115 1120 1125

Tyr Ser His Phe Gln Glu Thr Leu Gly Gly Leu Ala Thr Val Arg  
 1130 1135 1140

Gly Tyr Ser Gln Gln Lys Arg Phe Ser His Ile Asn Gln Cys Arg  
 1145 1150 1155

Ile Asp Asn Asn Met Ser Ala Phe Tyr Pro Ser Ile Asn Ala Asn  
 1160 1165 1170

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Arg	Trp	Leu	Ala	Tyr	Arg	Leu	Glu	Leu	Ile	Gly	Ser	Ile	Ile	Ile
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Leu	Gly	Ala	Ala	Thr	Leu	Ser	Val	Phe	Arg	Leu	Lys	Gln	Gly	Thr
	1190					1195					1200			
Leu	Thr	Ala	Gly	Met	Val	Gly	Leu	Ser	Leu	Ser	Tyr	Ala	Leu	Gln
	1205					1210					1215			
Ile	Thr	Gln	Thr	Leu	Asn	Trp	Ile	Val	Arg	Met	Thr	Val	Glu	Val
	1220					1225					1230			
Glu	Thr	Asn	Ile	Val	Ser	Val	Glu	Arg	Ile	Lys	Glu	Tyr	Ala	Asp
	1235					1240					1245			
Leu	Lys	Ser	Glu	Ala	Pro	Leu	Ile	Val	Glu	Gly	His	Arg	Pro	Pro
	1250					1255					1260			
Lys	Glu	Trp	Pro	Ser	Gln	Gly	Asp	Ile	Lys	Phe	Asn	Asn	Tyr	Ser
	1265					1270					1275			
Thr	Arg	Tyr	Arg	Pro	Glu	Leu	Asp	Leu	Val	Leu	Lys	His	Ile	Asn
	1280					1285					1290			
Ile	His	Ile	Lys	Pro	Asn	Glu	Lys	Val	Gly	Ile	Val	Gly	Arg	Thr
	1295					1300					1305			
Gly	Ala	Gly	Lys	Ser	Ser	Leu	Thr	Leu	Ala	Leu	Phe	Arg	Met	Ile
	1310					1315					1320			
Glu	Ala	Ser	Glu	Gly	Asn	Ile	Val	Ile	Asp	Asn	Ile	Ala	Ile	Asn
	1325					1330					1335			
Glu	Ile	Gly	Leu	Tyr	Asp	Leu	Arg	His	Lys	Leu	Ser	Ile	Ile	Pro
	1340					1345					1350			
Gln	Asp	Ser	Gln	Val	Phe	Glu	Gly	Thr	Val	Arg	Glu	Asn	Ile	Asp
	1355					1360					1365			
Pro	Ile	Asn	Gln	Tyr	Thr	Asp	Glu	Ala	Ile	Trp	Arg	Ala	Leu	Glu
	1370					1375					1380			
Leu	Ser	His	Leu	Lys	Glu	His	Val	Leu	Ser	Met	Ser	Asn	Asp	Gly
	1385					1390					1395			
Leu	Asp	Ala	Gln	Leu	Thr	Glu	Gly	Gly	Gly	Asn	Leu	Ser	Val	Gly
	1400					1405					1410			

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Gln Arg Gln Leu Leu Cys Leu Ala Arg Ala Met Leu Val Pro Ser  
1415 1420 1425

Lys Ile Leu Val Leu Asp Glu Ala Thr Ala Ala Val Asp Val Glu  
1430 1435 1440

Thr Asp Lys Val Val Gln Glu Thr Ile Arg Thr Ala Phe Lys Asp  
1445 1450 1455

Arg Thr Ile Leu Thr Ile Ala His Arg Leu Asn Thr Ile Met Asp  
1460 1465 1470

Ser Asp Arg Ile Ile Val Leu Asp Asn Gly Lys Val Ala Glu Phe  
1475 1480 1485

Asp Ser Pro Gly Gln Leu Leu Ser Asp Asn Lys Ser Leu Phe Tyr  
1490 1495 1500

Ser Leu Cys Met Glu Ala Gly Leu Val Asn Glu Asn Gly Gly Gly  
1505 1510 1515

Gly Gly Gly Met Leu Ser Arg Lys Gly Ile Ile Pro Glu Glu Tyr  
1520 1525 1530

Val Leu Thr Arg Leu Ala Glu Asp Pro Ala Glu Pro Arg Tyr Arg  
1535 1540 1545

Thr Arg Glu Arg Arg Ala Arg Phe Val Ser Lys Lys Gly Asn Cys  
1550 1555 1560

Asn Val Ala His Lys Asn Ile Arg Glu Gln Gly Arg Phe Leu Gln  
1565 1570 1575

Asp Val Phe Thr Thr Leu Val Asp Leu Lys Trp Pro His Thr Leu  
1580 1585 1590

Leu Ile Phe Thr Met Ser Phe Leu Cys Ser Trp Leu Leu Phe Ala  
1595 1600 1605

Met Val Trp Trp Leu Ile Ala Phe Ala His Gly Asp Leu Tyr Ala  
1610 1615 1620

Tyr Met Glu Lys Gly Ile Thr Asp Leu Ala Pro Tyr Pro Tyr Asp  
1625 1630 1635

Val Pro Asp Tyr Ala Gly Glu Gly Thr Asn Val Pro Cys Val Thr  
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1640		1645		1650	
Ser Ile 1655	His Ser Phe Ser	Ser Ala Phe Leu Phe Ser 1660	Ile Glu Val		
Gln Val 1670	Thr Ile Gly Phe	Gly Arg Met Val Thr 1680	Glu Glu Cys		
Pro Leu 1685	Ala Ile Leu Ile	Leu Ile Val Gln Asn Ile 1695	Val Gly Leu		
Met Ile 1700	Asn Ala Ile Met	Leu Gly Cys Ile Phe Met 1710	Lys Thr Ala		
Gln Ala 1715	His Arg Arg Ala	Glu Thr Leu Ile Phe Ser 1725	Lys His Ala		
Val Ile 1730	Thr Leu Arg His	Gly Arg Leu Cys Phe Met 1740	Leu Arg Val		
Gly Asp 1745	Leu Arg Lys Ser	Met Ile Ile Ser Ala Thr 1755	Ile His Met		
Gln Val 1760	Val Arg Lys Thr	Thr Ser Pro Glu Gly Glu 1770	Val Val Pro		
Leu His 1775	Gln Val Asp Ile	Pro Met Glu Asn Gly Val 1785	Gly Gly Asn		
Gly Ile 1790	Phe Leu Val Ala	Pro Leu Ile Ile Tyr His 1800	Val Ile Asp		
Ser Asn 1805	Ser Pro Leu Tyr	Asp Leu Ala Pro Ser Asp 1815	Leu His His		
His Gln 1820	Asp Leu Glu Ile	Ile Val Ile Leu Glu Gly 1830	Val Val Glu		
Thr Thr 1835	Gly Ile Thr Thr	Gln Ala Arg Thr Ser Tyr 1845	Leu Ala Asp		
Glu Ile 1850	Leu Trp Gly Gln	Arg Phe Val Pro Ile Val 1860	Ala Glu Glu		
Asp Gly 1865	Arg Tyr Ser Val	Asp Tyr Ser Lys Phe Gly 1875	Asn Thr Ile		



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Lys Val Pro Thr Pro Leu Cys Thr Ala Arg Gln Leu Asp Glu Asp  
1880 1885 1890

Arg Ser  
1895

<210> 10  
<211> 1901  
<212> PRT  
<213> Saccharomyces cerevisiae

<400> 10

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Glu Gly Phe Gly Pro Ile Ser Phe Tyr Gly Asp Phe Thr Gln Cys Phe  
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Ile Asp Gly Val Ile Leu Asn Leu Ser Ala Ile Phe Met Ile Thr Phe  
35 40 45

Gly Ile Arg Asp Leu Val Asn Leu Cys Lys Lys Lys His Ser Gly Ile  
50 55 60

Lys Tyr Arg Arg Asn Trp Ile Ile Val Ser Arg Met Ala Leu Val Leu  
65 70 75 80

Leu Glu Ile Ala Phe Val Ser Leu Ala Ser Leu Asn Ile Ser Lys Glu  
85 90 95

Glu Ala Glu Asn Phe Thr Ile Val Ser Gln Tyr Ala Ser Thr Met Leu  
100 105 110

Ser Leu Phe Val Ala Leu Ala Leu His Trp Ile Glu Tyr Asp Arg Ser  
115 120 125

Val Val Ala Asn Thr Val Leu Leu Phe Tyr Trp Leu Phe Glu Thr Phe  
130 135 140

Gly Asn Phe Ala Lys Leu Ile Asn Ile Leu Ile Arg His Thr Tyr Glu  
145 150 155 160

Gly Ile Trp Tyr Ser Gly Gln Thr Gly Phe Ile Leu Thr Leu Phe Gln  
165 170 175

Val Ile Thr Cys Ala Ser Ile Leu Leu Leu Glu Ala Leu Pro Lys Lys  
180 185 190

Pro Leu Met 195 Pro His Gln His Ile 200 His Gln Thr Leu 205 Thr Arg Arg Lys  
 Pro Asn 210 Pro Tyr Asp Ser Ala 215 Asn Ile Phe Ser Arg 220 Ile Thr Phe Ser  
 Trp 225 Met Ser Gly Leu Met 230 Lys Thr Gly Tyr Glu 235 Lys Tyr Leu Val Glu 240  
 Ala Asp Leu Tyr Lys 245 Leu Pro Arg Asn Phe 250 Ser Ser Glu Glu Leu 255 His  
 Gln Lys Leu Glu 260 Lys Asn Trp Glu Asn 265 Glu Leu Lys Gln Lys 270 Ser Asn  
 Pro Ser 275 Leu Ser Trp Ala Ile Cys 280 Arg Thr Phe Gly Ser 285 Lys Met Leu  
 Leu Ala 290 Ala Phe Phe Lys Ala 295 Ile His Asp Val Leu 300 Ala Phe Thr Gln  
 Pro 305 Gln Leu Leu Arg Ile 310 Leu Ile Lys Phe Val 315 Thr Asp Tyr Asn Ser 320  
 Glu Arg Gln Asp Asp 325 His Ser Ser Leu Gln 330 Gly Phe Glu Asn Asn 335 His  
 Pro Gln Lys 340 Leu Pro Ile Val Arg Gly 345 Phe Leu Ile Ala Phe 350 Ala Met  
 Phe Leu 355 Val Gly Phe Thr Gln Thr 360 Ser Val Leu His Gln 365 Tyr Phe Leu  
 Asn Val 370 Phe Asn Thr Gly Met 375 Tyr Ile Lys Ser Ala 380 Leu Thr Ala Leu  
 Ile 385 Tyr Gln Lys Ser Leu 390 Val Leu Ser Asn Glu 395 Ala Ser Gly Leu Ser 400  
 Ser Thr Gly Asp Ile 405 Val Asn Leu Met Ser 410 Val Asp Val Gln Lys 415 Leu  
 Gln Asp Leu Thr 420 Gln Trp Leu Asn Leu 425 Ile Trp Ser Gly Pro 430 Phe Gln  
 Ile Ile 435 Ile Cys Leu Tyr Ser Leu 440 Tyr Lys Leu Leu Gly 445 Asn Ser Met

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Trp Val Gly Val Ile Ile Leu Val Ile Met Met Pro Leu Asn Ser Phe  
 450 455 460

Leu Met Arg Ile Gln Lys Lys Leu Gln Lys Ser Gln Met Lys Tyr Lys  
 465 470 475 480

Asp Glu Arg Thr Arg Val Ile Ser Glu Ile Leu Asn Asn Ile Lys Ser  
 485 490 495

Leu Lys Leu Tyr Ala Trp Glu Lys Pro Tyr Arg Glu Lys Leu Glu Glu  
 500 505 510

Val Arg Asn Asn Lys Glu Leu Lys Asn Leu Thr Lys Leu Gly Cys Tyr  
 515 520 525

Met Ala Val Thr Ser Phe Gln Phe Asn Ile Val Pro Phe Leu Val Ser  
 530 535 540

Cys Cys Thr Phe Ala Val Phe Val Tyr Thr Glu Asp Arg Ala Leu Thr  
 545 550 555 560

Thr Asp Leu Val Phe Pro Ala Leu Thr Leu Phe Asn Leu Leu Ser Phe  
 565 570 575

Pro Leu Met Ile Ile Pro Met Val Leu Asn Ser Phe Ile Glu Ala Ser  
 580 585 590

Val Ser Ile Gly Arg Leu Phe Thr Phe Phe Thr Asn Glu Glu Leu Gln  
 595 600 605

Pro Asp Ser Val Gln Arg Leu Pro Lys Val Lys Asn Ile Gly Asp Val  
 610 615 620

Ala Ile Asn Ile Gly Asp Asp Ala Thr Phe Leu Trp Gln Arg Lys Pro  
 625 630 635 640

Glu Tyr Lys Val Ala Leu Lys Asn Ile Asn Phe Gln Ala Lys Lys Gly  
 645 650 655

Asn Leu Thr Cys Ile Val Gly Lys Val Gly Ser Gly Lys Thr Ala Leu  
 660 665 670

Leu Ser Cys Met Leu Gly Asp Arg Phe Arg Val Lys Gly Phe Ala Thr  
 675 680 685

Val His Gly Ser Val Ala Tyr Val Ser Gln Val Pro Trp Ile Met Asn  
 690 695 700

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Gly Thr Val Lys Glu Asn Ile Leu Phe Gly His Arg Tyr Asp Ala Glu  
 705 710 715 720  
 Phe Tyr Glu Lys Thr Ile Lys Ala Cys Ala Leu Thr Ile Asp Leu Ala  
 725 730 735  
 Ile Leu Met Asp Gly Asp Lys Thr Leu Val Gly Glu Lys Gly Ile Ser  
 740 745 750  
 Leu Ser Gly Gly Gln Lys Ala Arg Leu Ser Leu Ala Arg Ala Val Tyr  
 755 760 765  
 Ala Arg Ala Asp Thr Tyr Leu Leu Asp Asp Pro Leu Ala Ala Val Asp  
 770 775 780  
 Glu His Val Ala Arg His Leu Ile Glu His Val Leu Gly Pro Asn Gly  
 785 790 795 800  
 Leu Leu His Thr Lys Thr Lys Val Leu Ala Thr Asn Lys Val Ser Ala  
 805 810 815  
 Leu Ser Ile Ala Asp Ser Ile Ala Leu Leu Asp Asn Gly Glu Ile Thr  
 820 825 830  
 Gln Gln Gly Thr Tyr Asp Glu Ile Thr Lys Asp Ala Asp Ser Pro Leu  
 835 840 845  
 Trp Lys Leu Leu Asn Asn Tyr Gly Lys Lys Asn Asn Gly Lys Ser Asn  
 850 855 860  
 Glu Phe Gly Asp Ser Ser Glu Ser Ser Val Arg Glu Ser Ser Ile Pro  
 865 870 875 880  
 Val Glu Gly Glu Leu Glu Gln Leu Gln Lys Leu Asn Asp Leu Asp Phe  
 885 890 895  
 Gly Asn Ser Asp Ala Ile Ser Leu Arg Arg Ala Ser Asp Ala Thr Leu  
 900 905 910  
 Gly Ser Ile Asp Phe Gly Asp Asp Glu Asn Ile Ala Lys Arg Glu His  
 915 920 925  
 Arg Glu Gln Gly Lys Val Lys Trp Asn Ile Tyr Leu Glu Tyr Ala Lys  
 930 935  
 Ala Cys Asn Pro Lys Ser Val Cys Val Phe Ile Leu Phe Ile Val Ile  
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945                      950                      955                      960  
 Ser Met Phe Leu Ser Val Met Gly Asn Val Trp Leu Lys His Trp Ser  
                                  965                      970                      975  
 Glu Val Asn Ser Arg Tyr Gly Ser Asn Pro Asn Ala Ala Arg Tyr Leu  
                                  980                      985                      990  
 Ala Ile Tyr Phe Ala Leu Gly Ile Gly Ser Ala Leu Ala Thr Leu Ile  
                                  995                      1000                      1005  
 Gln Thr Ile Val Leu Trp Val Phe Cys Thr Ile His Ala Ser Lys  
                                  1010                      1015                      1020  
 Tyr Leu His Asn Leu Met Thr Asn Ser Val Leu Arg Ala Pro Met  
                                  1025                      1030                      1035  
 Thr Phe Phe Glu Thr Thr Pro Ile Gly Arg Ile Leu Asn Arg Phe  
                                  1040                      1045                      1050  
 Ser Asn Asp Ile Tyr Lys Val Asp Ala Leu Leu Gly Arg Thr Phe  
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 Ser Gln Phe Phe Val Asn Ala Val Lys Val Thr Phe Thr Ile Thr  
                                  1070                      1075                      1080  
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                                  1085                      1090                      1095  
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                                  1100                      1105                      1110  
 Ser Arg Glu Leu Arg Arg Leu Asp Ser Ile Thr Arg Ser Pro Ile  
                                  1115                      1120                      1125  
 Tyr Ser His Phe Gln Glu Thr Leu Gly Gly Leu Ala Thr Val Arg  
                                  1130                      1135                      1140  
 Gly Tyr Ser Gln Gln Lys Arg Phe Ser His Ile Asn Gln Cys Arg  
                                  1145                      1150                      1155  
 Ile Asp Asn Asn Met Ser Ala Phe Tyr Pro Ser Ile Asn Ala Asn  
                                  1160                      1165                      1170  
 Arg Trp Leu Ala Tyr Arg Leu Glu Leu Ile Gly Ser Ile Ile Ile  
                                  1175                      1180                      1185

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Leu Gly 1190	Ala Ala Thr Leu	Ser Val Phe Arg Leu Lys 1195	Gln Gly Thr
Leu Thr 1205	Ala Gly Met Val	Gly Leu Ser Leu Ser Tyr 1210	Ala Leu Gln
Ile Thr 1220	Gln Thr Leu Asn	Trp Ile Val Arg Met Thr 1225	Val Glu Val
Glu Thr 1235	Asn Ile Val Ser	Val Glu Arg Ile Lys Glu 1240	Tyr Ala Asp
Leu Lys 1250	Ser Glu Ala Pro	Leu Ile Val Glu Gly His 1255	Arg Pro Pro
Lys Glu 1265	Trp Pro Ser Gln	Gly Asp Ile Lys Phe Asn 1270	Asn Tyr Ser
Thr Arg 1280	Tyr Arg Pro Glu	Leu Asp Leu Val Leu Lys 1285	His Ile Asn
Ile His 1295	Ile Lys Pro Asn	Glu Lys Val Gly Ile Val 1300	Gly Arg Thr
Gly Ala 1310	Gly Lys Ser Ser	Leu Thr Leu Ala Leu Phe 1315	Arg Met Ile
Glu Ala 1325	Ser Glu Gly Asn	Ile Val Ile Asp Asn Ile 1330	Ala Ile Asn
Glu Ile 1340	Gly Leu Tyr Asp	Leu Arg His Lys Leu Ser 1345	Ile Ile Pro
Gln Asp 1355	Ser Gln Val Phe	Glu Gly Thr Val Arg Glu 1360	Asn Ile Asp
Pro Ile 1370	Asn Gln Tyr Thr	Asp Glu Ala Ile Trp Arg 1375	Ala Leu Glu
Leu Ser 1385	His Leu Lys Glu	His Val Leu Ser Met Ser 1390	Asn Asp Gly
Leu Asp 1400	Ala Gln Leu Thr	Glu Gly Gly Gly Asn Leu 1405	Ser Val Gly
Gln Arg 1415	Gln Leu Leu Cys	Leu Ala Arg Ala Met Leu 1420	Val Pro Ser

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Lys Ile Leu Val Leu Asp Glu Ala Thr Ala Ala Val Asp Val Glu  
 1430 1435 1440  
 Thr Asp Lys Val Val Gln Glu Thr Ile Arg Thr Ala Phe Lys Asp  
 1445 1450 1455  
 Arg Thr Ile Leu Thr Ile Ala His Arg Leu Asn Thr Ile Met Asp  
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 Ser Asp Arg Ile Ile Val Leu Asp Asn Gly Lys Val Ala Glu Phe  
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 Ser Leu Cys Met Glu Ala Gly Leu Val Asn Glu Asn Gly Gly Gly  
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 Gly Gly Gly Met Leu Ser Arg Lys Gly Ile Ile Pro Glu Glu Tyr  
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 Val Leu Thr Arg Leu Ala Glu Asp Pro Ala Glu Pro Arg Tyr Arg  
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 Thr Arg Glu Arg Arg Ala Arg Phe Val Ser Lys Lys Gly Asn Cys  
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 Asn Val Ala His Lys Asn Ile Arg Glu Gln Gly Arg Phe Leu Gln  
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 Asp Val Phe Thr Thr Leu Val Asp Leu Lys Trp Pro His Thr Leu  
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 Leu Ile Phe Thr Met Ser Phe Leu Cys Ser Trp Leu Leu Phe Ala  
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 Met Val Trp Trp Leu Ile Ala Phe Ala His Gly Asp Leu Tyr Ala  
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 Tyr Met Glu Lys Gly Ile Thr Asp Leu Ala Pro Tyr Pro Tyr Asp  
 1625 1630 1635  
 Val Pro Asp Tyr Ala Gly Glu Gly Thr Asn Val Pro Cys Val Thr  
 1640 1645 1650  
 Ser Ile His Ser Phe Ser Ser Ala Phe Leu Phe Ser Ile Glu Val  
 1655 1660 1665

Gln Val Thr Ile Gly Phe Gly Gly Arg Met Val Thr Glu Glu Cys  
 1670 1675 1680  
 Pro Leu Ala Ile Leu Ile Leu Ile Val Gln Asn Ile Val Gly Leu  
 1685 1690 1695  
 Met Ile Asn Ala Ile Met Leu Gly Cys Ile Phe Met Lys Thr Ala  
 1700 1705 1710  
 Gln Ala His Arg Arg Ala Glu Thr Leu Ile Phe Ser Lys His Ala  
 1715 1720 1725  
 Val Ile Thr Leu Arg His Gly Arg Leu Cys Phe Met Leu Arg Val  
 1730 1735 1740  
 Gly Asp Leu Arg Lys Ser Met Ile Ile Ser Ala Thr Ile His Met  
 1745 1750 1755  
 Gln Val Val Arg Lys Thr Thr Ser Pro Glu Gly Glu Val Val Pro  
 1760 1765 1770  
 Leu His Gln Val Asp Ile Pro Met Glu Asn Gly Val Gly Gly Asn  
 1775 1780 1785  
 Gly Ile Phe Leu Val Ala Pro Leu Ile Ile Tyr His Val Ile Asp  
 1790 1795 1800  
 Ser Asn Ser Pro Leu Tyr Asp Leu Ala Pro Ser Asp Leu His His  
 1805 1810 1815  
 His Gln Asp Leu Glu Ile Ile Val Ile Leu Glu Gly Val Val Glu  
 1820 1825 1830  
 Thr Thr Gly Ile Thr Thr Gln Ala Arg Thr Ser Tyr Leu Ala Asp  
 1835 1840 1845  
 Glu Ile Leu Trp Gly Gln Arg Phe Val Pro Ile Val Ala Glu Glu  
 1850 1855 1860  
 Asp Gly Arg Tyr Ser Val Asp Tyr Ser Lys Phe Gly Asn Thr Ile  
 1865 1870 1875  
 Lys Val Pro Thr Pro Leu Cys Thr Ala Arg Gln Leu Asp Glu Asp  
 1880 1885 1890  
 Arg Ser Phe Cys Tyr Glu Asn Glu



1895

1900

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<210> 11  
 <211> 1695  
 <212> PRT  
 <213> Homo sapiens

<400> 11

Met Asp Leu Glu Gly Asp Arg Asn Gly Gly Ala Lys Lys Lys Asn Phe  
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 35 40 45  
 Leu Tyr Met Val Val Gly Thr Leu Ala Ala Ile Ile His Gly Ala Gly  
 50 55 60  
 Leu Pro Leu Met Met Leu Val Phe Gly Glu Met Thr Asp Ile Phe Ala  
 65 70 75 80  
 Asn Ala Gly Asn Leu Glu Asp Leu Met Ser Asn Ile Thr Asn Arg Ser  
 85 90 95  
 Asp Ile Asn Asp Thr Gly Phe Phe Met Asn Leu Glu Glu Asp Met Thr  
 100 105 110  
 Arg Tyr Ala Tyr Tyr Tyr Ser Gly Ile Gly Ala Gly Val Leu Val Ala  
 115 120 125  
 Ala Tyr Ile Gln Val Ser Phe Trp Cys Leu Ala Ala Gly Arg Gln Ile  
 130 135 140  
 His Lys Ile Arg Lys Gln Phe Phe His Ala Ile Met Arg Gln Glu Ile  
 145 150 155 160  
 Gly Trp Phe Asp Val His Asp Val Gly Glu Leu Asn Thr Arg Leu Thr  
 165 170 175  
 Asp Asp Val Ser Lys Ile Asn Glu Gly Ile Gly Asp Lys Ile Gly Met  
 180 185 190  
 Phe Phe Gln Ser Met Ala Thr Phe Phe Thr Gly Phe Ile Val Gly Phe  
 195 200 205  
 Thr Arg Gly Trp Lys Leu Thr Leu Val Ile Leu Ala Ile Ser Pro Val

210  
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 225 230 235 240  
 Asp Lys Glu Leu Leu Ala Tyr Ala Lys Ala Gly Ala Val Ala Glu Glu  
 245 250 255  
 Val Leu Ala Ala Ile Arg Thr Val Ile Ala Phe Gly Gly Gln Lys Lys  
 260 265 270  
 Glu Leu Glu Arg Tyr Asn Lys Asn Leu Glu Glu Ala Lys Arg Ile Gly  
 275 280 285  
 Ile Lys Lys Ala Ile Thr Ala Asn Ile Ser Ile Gly Ala Ala Phe Leu  
 290 295 300  
 Leu Ile Tyr Ala Ser Tyr Ala Leu Ala Phe Trp Tyr Gly Thr Thr Leu  
 305 310 315 320  
 Val Leu Ser Gly Glu Tyr Ser Ile Gly Gln Val Leu Thr Val Phe Ser  
 325 330 335  
 Val Leu Ile Gly Ala Phe Ser Val Gly Gln Ala Ser Pro Ser Ile Glu  
 340 345 350  
 Ala Phe Ala Asn Ala Arg Gly Ala Ala Tyr Glu Ile Phe Lys Ile Ile  
 355 360 365  
 Asp Asn Lys Pro Ser Ile Asp Ser Tyr Ser Lys Ser Gly His Lys Pro  
 370 375 380  
 Asp Asn Ile Lys Gly Asn Leu Glu Phe Arg Asn Val His Phe Ser Tyr  
 385 390 395 400  
 Pro Ser Arg Lys Glu Val Lys Ile Leu Lys Gly Leu Asn Leu Lys Val  
 405 410 415  
 Gln Ser Gly Gln Thr Val Ala Leu Val Gly Asn Ser Gly Cys Gly Lys  
 420 425 430  
 Ser Thr Thr Val Gln Leu Met Gln Arg Leu Tyr Asp Pro Thr Glu Gly  
 435 440 445  
 Met Val Ser Val Asp Gly Gln Asp Ile Arg Thr Ile Asn Val Arg Phe  
 450 455 460

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Leu Arg Glu Ile Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe Ala  
465 470 475 480

Thr Thr Ile Ala Glu Asn Ile Arg Tyr Gly Arg Glu Asn Val Thr Met  
485 490 495

Asp Glu Ile Glu Lys Ala Val Lys Glu Ala Asn Ala Tyr Asp Phe Ile  
500 505 510

Met Lys Leu Pro His Lys Phe Asp Thr Leu Val Gly Glu Arg Gly Ala  
515 520 525

Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu  
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Val Arg Asn Pro Lys Ile Leu Leu Leu Asp Glu Ala Thr Ser Ala Leu  
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Asp Thr Glu Ser Glu Ala Val Val Gln Val Ala Leu Asp Lys Ala Arg  
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Lys Gly Arg Thr Thr Ile Val Ile Ala His Arg Leu Ser Thr Val Arg  
580 585 590

Asn Ala Asp Val Ile Ala Gly Phe Asp Asp Gly Val Ile Val Glu Lys  
595 600 605

Gly Asn His Asp Glu Leu Met Lys Glu Lys Gly Ile Tyr Phe Lys Leu  
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Val Thr Met Gln Thr Ala Gly Asn Glu Val Glu Leu Glu Asn Ala Ala  
625 630 635 640

Asp Glu Ser Lys Ser Glu Ile Asp Ala Leu Glu Met Ser Ser Asn Asp  
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Ser Arg Ser Ser Leu Ile Arg Lys Arg Ser Thr Arg Arg Ser Val Arg  
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Gly Ser Gln Ala Gln Asp Arg Lys Leu Ser Thr Lys Glu Ala Leu Asp  
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Glu Ser Ile Pro Pro Val Ser Phe Trp Arg Ile Met Lys Leu Asn Leu  
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Thr Glu Trp Pro Tyr Phe Val Val Gly Val Phe Cys Ala Ile Ile Asn  
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Gly Gly Leu Gln Pro Ala Phe Ala Ile Ile Phe Ser Lys Ile Ile Gly  
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Val Phe Thr Arg Ile Asp Asp Pro Glu Thr Lys Arg Gln Asn Ser Asn  
740 745 750

Leu Phe Ser Leu Leu Phe Leu Ala Leu Gly Ile Ile Ser Phe Ile Thr  
755 760 765

Phe Phe Leu Gln Gly Phe Thr Phe Gly Lys Ala Gly Glu Ile Leu Thr  
770 775 780

Lys Arg Leu Arg Tyr Met Val Phe Arg Ser Met Leu Arg Gln Asp Val  
785 790 795 800

Ser Trp Phe Asp Asp Pro Lys Asn Thr Thr Gly Ala Leu Thr Thr Arg  
805 810 815

Leu Ala Asn Asp Ala Ala Gln Val Lys Gly Ala Ile Gly Ser Arg Leu  
820 825 830

Ala Val Ile Thr Gln Asn Ile Ala Asn Leu Gly Thr Gly Ile Ile Ile  
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Ser Phe Ile Tyr Gly Trp Gln Leu Thr Leu Leu Leu Leu Ala Ile Val  
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Pro Ile Ile Ala Ile Ala Gly Val Val Glu Met Lys Met Leu Ser Gly  
865 870 875 880

Gln Ala Leu Lys Asp Lys Lys Glu Leu Glu Gly Ala Gly Lys Ile Ala  
885 890 895

Thr Glu Ala Ile Glu Asn Phe Arg Thr Val Val Ser Leu Thr Gln Glu  
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Gln Lys Phe Glu His Met Tyr Ala Gln Ser Leu Gln Val Pro Tyr Arg  
915 920 925

Asn Ser Leu Arg Lys Ala His Ile Phe Gly Ile Thr Phe Ser Phe Thr  
930 935 940

Gln Ala Met Met Tyr Phe Ser Tyr Ala Gly Cys Phe Arg Phe Gly Ala  
945 950 955 960

Tyr Leu Val Ala His Lys Leu Met Ser Phe Glu Asp Val Leu Leu Val  
965 970 975

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Phe Ser Ala Val Val Phe Gly Ala Met Ala Val Gly Gln Val Ser Ser  
 980 985 990  
 Phe Ala Pro Asp Tyr Ala Lys Ala Lys Ile Ser Ala Ala His Ile Ile  
 995 1000 1005  
 Met Ile Ile Glu Lys Thr Pro Leu Ile Asp Ser Tyr Ser Thr Glu  
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 Gly Leu Met Pro Asn Thr Leu Glu Gly Asn Val Thr Phe Gly Glu  
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 Val Val Phe Asn Tyr Pro Thr Arg Pro Asp Ile Pro Val Leu Gln  
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 Gly Leu Ser Leu Glu Val Lys Lys Gly Gln Thr Leu Ala Leu Val  
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 Gly Ser Ser Gly Cys Gly Lys Ser Thr Val Val Gln Leu Leu Glu  
 1070 1075 1080  
 Arg Phe Tyr Asp Pro Leu Ala Gly Lys Val Leu Leu Asp Gly Lys  
 1085 1090 1095  
 Glu Ile Lys Arg Leu Asn Val Gln Trp Leu Arg Ala His Leu Gly  
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 Ile Val Ser Gln Glu Pro Ile Leu Phe Asp Cys Ser Ile Ala Glu  
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 Asn Ile Ala Tyr Gly Asp Asn Ser Arg Val Val Ser Gln Glu Glu  
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 Ser Leu Pro Asn Lys Tyr Ser Thr Lys Val Gly Asp Lys Gly Thr  
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 Gln Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala  
 1175 1180 1185  
 Leu Val Arg Gln Pro His Ile Leu Leu Leu Asp Glu Ala Thr Ser  
 1190 1195 1200  
 Ala Leu Asp Thr Glu Ser Glu Lys Val Val Gln Glu Ala Leu Asp  
 Page 85

Lys	Ala 1220	Arg	Glu	Gly	Arg	Thr 1225	Cys	Ile	Val	Ile	Ala 1230	His	Arg	Leu
Ser	Thr 1235	Ile	Gln	Asn	Ala	Asp 1240	Leu	Ile	Val	Val	Phe 1245	Gln	Asn	Gly
Arg	Val 1250	Lys	Glu	His	Gly	Thr 1255	His	Gln	Gln	Leu	Leu 1260	Ala	Gln	Lys
Gly	Ile 1265	Tyr	Phe	Ser	Met	Val 1270	Ser	Val	Gln	Ala	Gly 1275	Thr	Lys	Arg
Gln	Gly 1280	Gly	Gly	Gly	Gly	Gly 1285	Met	Leu	Ser	Arg	Lys 1290	Gly	Ile	Ile
Pro	Glu 1295	Glu	Tyr	Val	Leu	Thr 1300	Arg	Leu	Ala	Glu	Asp 1305	Pro	Ala	Glu
Pro	Arg 1310	Tyr	Arg	Thr	Arg	Glu 1315	Arg	Arg	Ala	Arg	Phe 1320	Val	Ser	Lys
Lys	Gly 1325	Asn	Cys	Asn	Val	Ala 1330	His	Lys	Asn	Ile	Arg 1335	Glu	Gln	Gly
Arg	Phe 1340	Leu	Gln	Asp	Val	Phe 1345	Thr	Thr	Leu	Val	Asp 1350	Leu	Lys	Trp
Pro	His 1355	Thr	Leu	Leu	Ile	Phe 1360	Thr	Met	Ser	Phe	Leu 1365	Cys	Ser	Trp
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Asp	Leu 1385	Tyr	Ala	Tyr	Met	Glu 1390	Lys	Gly	Ile	Thr	Asp 1395	Leu	Ala	Pro
Tyr	Pro 1400	Tyr	Asp	Val	Pro	Asp 1405	Tyr	Ala	Gly	Glu	Gly 1410	Thr	Asn	Val
Pro	Cys 1415	Val	Thr	Ser	Ile	His 1420	Ser	Phe	Ser	Ser	Ala 1425	Phe	Leu	Phe
Ser	Ile 1430	Glu	Val	Gln	Val	Thr 1435	Ile	Gly	Phe	Gly	Gly 1440	Arg	Met	Val

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Thr	Glu	Glu	Cys	Pro	Leu	Ala	Ile	Leu	Ile	Leu	Ile	Val	Gln	Asn
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Ile	Val	Gly	Leu	Met	Ile	Asn	Ala	Ile	Met	Leu	Gly	Cys	Ile	Phe
1460						1465					1470			
Met	Lys	Thr	Ala	Gln	Ala	His	Arg	Arg	Ala	Glu	Thr	Leu	Ile	Phe
1475						1480					1485			
Ser	Lys	His	Ala	Val	Ile	Thr	Leu	Arg	His	Gly	Arg	Leu	Cys	Phe
1490						1495					1500			
Met	Leu	Arg	Val	Gly	Asp	Leu	Arg	Lys	Ser	Met	Ile	Ile	Ser	Ala
1505						1510					1515			
Thr	Ile	His	Met	Gln	Val	Val	Arg	Lys	Thr	Thr	Ser	Pro	Glu	Gly
1520						1525					1530			
Glu	Val	Val	Pro	Leu	His	Gln	Val	Asp	Ile	Pro	Met	Glu	Asn	Gly
1535						1540					1545			
Val	Gly	Gly	Asn	Gly	Ile	Phe	Leu	Val	Ala	Pro	Leu	Ile	Ile	Tyr
1550						1555					1560			
His	Val	Ile	Asp	Ser	Asn	Ser	Pro	Leu	Tyr	Asp	Leu	Ala	Pro	Ser
1565						1570					1575			
Asp	Leu	His	His	His	Gln	Asp	Leu	Glu	Ile	Ile	Val	Ile	Leu	Glu
1580						1585					1590			
Gly	Val	Val	Glu	Thr	Thr	Gly	Ile	Thr	Thr	Gln	Ala	Arg	Thr	Ser
1595						1600					1605			
Tyr	Leu	Ala	Asp	Glu	Ile	Leu	Trp	Gly	Gln	Arg	Phe	Val	Pro	Ile
1610						1615					1620			
Val	Ala	Glu	Glu	Asp	Gly	Arg	Tyr	Ser	Val	Asp	Tyr	Ser	Lys	Phe
1625						1630					1635			
Gly	Asn	Thr	Ile	Lys	Val	Pro	Thr	Pro	Leu	Cys	Thr	Ala	Arg	Gln
1640						1645					1650			
Leu	Asp	Glu	Asp	Arg	Ser	Leu	Leu	Asp	Ala	Leu	Thr	Leu	Ala	Ser
1655						1660					1665			
Ser	Arg	Gly	Pro	Leu	Arg	Lys	Arg	Ser	Val	Ala	Val	Ala	Lys	Ala
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Lys Pro Glu Phe Ser Ile Ser Pro Asp Ser Leu Ser  
1685 1690 1695

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<213> Rattus rattus

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Pro His Val Phe Leu Leu Phe Ile Thr Phe Pro Ile Leu Phe Ile Gly  
35 40 45

Trp Gly Ser Gln Ser Ser Lys Val Gln Ile His His Asn Thr Trp Leu  
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His Phe Pro Gly His Asn Leu Arg Trp Ile Leu Thr Phe Ala Leu Leu  
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Phe Val His Val Cys Glu Ile Ala Glu Gly Ile Val Ser Asp Ser Gln  
85 90 95

Arg Ala Ser Arg His Leu His Leu Phe Met Pro Ala Val Met Gly Phe  
100 105 110

Val Ala Thr Thr Thr Ser Ile Val Tyr Tyr His Asn Ile Glu Thr Ser  
115 120 125

Asn Phe Pro Lys Leu Leu Leu Ala Leu Phe Leu Tyr Trp Val Met Ala  
130 135 140

Phe Ile Thr Lys Thr Ile Lys Leu Val Lys Tyr Trp Gln Leu Gly Trp  
145 150 155 160

Gly Met Ser Asp Leu Arg Phe Cys Ile Thr Gly Val Met Val Ile Leu  
165 170 175

Asn Gly Leu Leu Met Ala Val Glu Ile Asn Val Ile Arg Val Arg Arg  
180 185 190

Tyr Val Phe Phe Met Asn Pro Gln Lys Val Lys Pro Pro Glu Asp Leu  
195 200 205



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Gln Asp Leu Gly Val Arg Phe Leu Gln Pro Phe Val Asn Leu Leu Ser  
 210 215 220

Lys Ala Thr Tyr Trp Trp Met Asn Thr Leu Ile Ile Ser Ala His Arg  
 225 230 235 240

Lys Pro Ile Asp Leu Lys Ala Ile Gly Lys Leu Pro Ile Ala Met Arg  
 245 250 255

Ala Val Thr Asn Tyr Val Cys Leu Lys Glu Ala Tyr Glu Glu Gln Lys  
 260 265 270

Lys Lys Ala Ala Asp His Pro Asn Arg Thr Pro Ser Ile Trp Leu Ala  
 275 280 285

Met Tyr Arg Ala Phe Gly Arg Pro Ile Leu Leu Ser Ser Thr Phe Arg  
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Tyr Leu Ala Asp Leu Leu Gly Phe Ala Gly Pro Leu Cys Ile Ser Gly  
 305 310 315 320

Ile Val Gln Arg Val Asn Glu Pro Lys Asn Asn Thr Thr Arg Phe Ser  
 325 330 335

Glu Thr Leu Ser Ser Lys Glu Phe Leu Glu Asn Ala His Val Leu Ala  
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Val Leu Leu Phe Leu Ala Leu Ile Leu Gln Arg Thr Phe Leu Gln Ala  
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Ser Tyr Tyr Val Thr Ile Glu Thr Gly Ile Asn Leu Arg Gly Ala Leu  
 370 375 380

Leu Ala Met Ile Tyr Asn Lys Ile Leu Arg Leu Ser Thr Ser Asn Leu  
 385 390 395 400

Ser Met Gly Glu Met Thr Leu Gly Gln Ile Asn Asn Leu Val Ala Ile  
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Glu Thr Asn Gln Leu Met Trp Phe Leu Phe Leu Cys Pro Asn Leu Trp  
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Ala Met Pro Val Gln Ile Ile Met Gly Val Ile Leu Leu Tyr Asn Leu  
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Leu Gly Ser Ser Ala Leu Val Gly Ala Ala Val Ile Val Leu Leu Ala  
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Pro Ile Gln Tyr Phe Ile Ala Thr Lys Leu Ala Glu Ala Gln Lys Ser  
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Thr Leu Asp Tyr Ser Thr Glu Arg Leu Lys Lys Thr Asn Glu Ile Leu  
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Lys Gly Ile Lys Leu Leu Lys Leu Tyr Ala Trp Glu His Ile Phe Cys  
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Lys Ser Val Glu Glu Thr Arg Met Lys Glu Leu Ser Ser Leu Lys Thr  
515 520 525

Phe Ala Leu Tyr Thr Ser Leu Ser Ile Phe Met Asn Ala Ala Ile Pro  
530 535 540

Ile Ala Ala Val Leu Ala Thr Phe Val Thr His Ala Tyr Ala Ser Gly  
545 550 555 560

Asn Asn Leu Lys Pro Ala Glu Ala Phe Ala Ser Leu Ser Leu Phe His  
565 570 575

Ile Leu Val Thr Pro Leu Phe Leu Leu Ser Thr Val Val Arg Phe Ala  
580 585 590

Val Lys Ala Ile Ile Ser Val Gln Lys Leu Asn Glu Phe Leu Leu Ser  
595 600 605

Asp Glu Ile Gly Glu Asp Ser Trp Arg Thr Gly Glu Gly Thr Leu Pro  
610 615 620

Phe Glu Ser Cys Lys Lys His Thr Gly Val Gln Ser Lys Pro Ile Asn  
625 630 635 640

Arg Lys Gln Pro Gly Arg Tyr His Leu Asp Asn Tyr Glu Gln Ala Arg  
645 650 655

Arg Leu Arg Pro Ala Glu Thr Glu Asp Val Ala Ile Lys Val Thr Asn  
660 665 670

Gly Tyr Phe Ser Trp Gly Ser Gly Leu Ala Thr Leu Ser Asn Ile Asp  
675 680 685

Ile Arg Ile Pro Thr Gly Gln Leu Thr Met Ile Val Gly Gln Val Gly  
690 695 700

Cys Gly Lys Ser Ser Leu Leu Leu Ala Ile Leu Gly Glu Met Gln Thr  
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710  
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715  
720

Leu Glu Gly Lys Val Tyr Trp Asn Asn Val Asn Glu Ser Glu Pro Ser  
725 730 735

Phe Glu Ala Thr Arg Ser Arg Ser Arg Tyr Ser Val Ala Tyr Ala Ala  
740 745 750

Gln Lys Pro Trp Leu Leu Asn Ala Thr Val Glu Glu Asn Ile Thr Phe  
755 760 765

Gly Ser Ser Phe Asn Arg Gln Arg Tyr Lys Ala Val Thr Asp Ala Cys  
770 775 780

Ser Leu Gln Pro Asp Ile Asp Leu Leu Pro Phe Gly Asp Gln Thr Glu  
785 790 795 800

Ile Gly Glu Arg Gly Ile Asn Leu Ser Gly Gly Gln Arg Gln Arg Ile  
805 810 815

Cys Val Ala Arg Ala Leu Tyr Gln Asn Thr Asn Ile Val Phe Leu Asp  
820 825 830

Asp Pro Phe Ser Ala Leu Asp Ile His Leu Ser Asp His Leu Met Gln  
835 840 845

Glu Gly Ile Leu Lys Phe Leu Gln Asp Asp Lys Arg Thr Val Val Leu  
850 855 860

Val Thr His Lys Leu Gln Tyr Leu Thr His Ala Asp Trp Ile Ile Ala  
865 870 875 880

Met Lys Asp Gly Ser Val Leu Arg Glu Gly Thr Leu Lys Asp Ile Gln  
885 890 895

Thr Lys Asp Val Glu Leu Tyr Glu His Trp Lys Thr Leu Met Asn Arg  
900 905 910

Gln Asp Gln Glu Leu Glu Lys Asp Met Glu Ala Asp Gln Thr Thr Leu  
915 920 925

Glu Arg Lys Thr Leu Arg Arg Ala Met Tyr Ser Arg Glu Ala Lys Ala  
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Gln Met Glu Asp Glu Asp Glu Glu Glu Glu Glu Glu Asp Glu Asp  
945 950 955 960

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Asp Asn Met Ser Thr Val Met Arg Leu Arg Thr Lys Met Pro Trp Lys  
 965 970 975

Thr Cys Trp Trp Tyr Leu Thr Ser Gly Gly Phe Phe Leu Leu Phe Leu  
 980 985 990

Met Ile Phe Ser Lys Leu Leu Lys His Ser Val Ile Val Ala Ile Asp  
 995 1000 1005

Tyr Trp Leu Ala Thr Trp Thr Ser Glu Tyr Ser Ile Asn Asp Pro  
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Gly Lys Ala Asp Gln Thr Phe Tyr Val Ala Gly Phe Ser Ile Leu  
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Cys Gly Ala Gly Ile Phe Leu Cys Leu Val Thr Ser Leu Thr Val  
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Glu Trp Met Gly Leu Thr Ala Ala Lys Asn Leu His His Asn Leu  
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Leu Asn Lys Ile Ile Leu Gly Pro Ile Arg Phe Phe Asp Thr Thr  
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Pro Leu Gly Leu Ile Leu Asn Arg Phe Ser Ala Asp Thr Asn Ile  
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Ile Asp Gln His Ile Pro Pro Thr Leu Glu Ser Leu Thr Arg Ser  
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Thr Leu Leu Cys Leu Ser Ala Ile Gly Met Ile Ser Tyr Ala Thr  
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Pro Val Phe Leu Ile Ala Leu Ala Pro Leu Gly Val Ala Phe Tyr  
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Phe Ile Gln Lys Tyr Phe Arg Val Ala Ser Lys Asp Leu Gln Glu  
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Leu Asp Asp Ser Thr Gln Leu Pro Leu Leu Cys His Phe Ser Glu  
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Thr Ala Glu Gly Leu Thr Thr Ile Arg Ala Phe Arg His Glu Thr  
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Arg Phe Lys Gln Arg Met Leu Glu Leu Thr Asp Thr Asn Asn Ile  
 1190 1195 1200

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Ala Tyr Leu Phe Leu Ser Ala Ala Asn Arg Trp Leu Glu Val Arg  
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Thr Asp Tyr Leu Gly Ala Cys Ile Val Leu Thr Ala Ser Ile Ala  
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Ser Ile Ser Gly Ser Ser Asn Ser Gly Leu Val Gly Leu Gly Leu  
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Leu Tyr Ala Leu Thr Ile Thr Asn Tyr Leu Asn Trp Val Val Arg  
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Asn Leu Ala Asp Leu Glu Val Gln Met Gly Ala Val Lys Lys Val  
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Asn Ser Phe Leu Thr Met Glu Ser Glu Asn Tyr Glu Gly Thr Met  
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Asp Pro Ser Gln Val Pro Glu His Trp Pro Gln Glu Gly Glu Ile  
1295 1300 1305

Lys Ile His Asp Leu Cys Val Arg Tyr Glu Asn Asn Leu Lys Pro  
1310 1315 1320

Val Leu Lys His Val Lys Ala Tyr Ile Lys Pro Gly Gln Lys Val  
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Gly Ile Cys Gly Arg Thr Gly Ser Gly Lys Ser Ser Leu Ser Leu  
1340 1345 1350

Ala Phe Phe Arg Met Val Asp Ile Phe Asp Gly Lys Ile Val Ile  
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Asp Gly Ile Asp Ile Ser Lys Leu Pro Leu His Thr Leu Arg Ser  
1370 1375 1380

Arg Leu Ser Ile Ile Leu Gln Asp Pro Ile Leu Phe Ser Gly Ser  
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Ile Arg Phe Asn Leu Asp Pro Glu Cys Lys Cys Thr Asp Asp Arg  
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Leu Trp Glu Ala Leu Glu Ile Ala Gln Leu Lys Asn Met Val Lys  
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Ser Leu Pro Gly Gly Leu Asp Ala Thr Val Thr Glu Gly Gly Glu  
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 1445 1450 1455  
 Phe Val Arg Lys Ser Ser Ile Leu Ile Met Asp Glu Ala Thr Ala  
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 Ser Ile Asp Met Ala Thr Glu Asn Ile Leu Gln Lys Val Val Met  
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 Thr Ala Phe Ala Asp Arg Thr Val Val Thr Ile Ala His Arg Val  
 1490 1495 1500  
 Ser Ser Ile Met Asp Ala Gly Leu Val Leu Val Phe Ser Glu Gly  
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 Ile Leu Val Glu Cys Asp Thr Gly Pro Asn Leu Leu Gln His Lys  
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 Asn Gly Leu Phe Ser Thr Leu Val Met Thr Asn Lys Gly Gly Gly  
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 Gly Gly Gly Met Leu Ser Arg Lys Gly Ile Ile Pro Glu Glu Tyr  
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 Val Leu Thr Arg Leu Ala Glu Asp Pro Ala Glu Pro Arg Tyr Arg  
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 Thr Arg Glu Arg Arg Ala Arg Phe Val Ser Lys Lys Gly Asn Cys  
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 Asn Val Ala His Lys Asn Ile Arg Glu Gln Gly Arg Phe Leu Gln  
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 Asp Val Phe Thr Thr Leu Val Asp Leu Lys Trp Pro His Thr Leu  
 1610 1615 1620  
 Leu Ile Phe Thr Met Ser Phe Leu Cys Ser Trp Leu Leu Phe Ala  
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 Met Val Trp Trp Leu Ile Ala Phe Ala His Gly Asp Leu Ala Pro  
 1640 1645 1650  
 Gly Glu Gly Thr Asn Val Pro Cys Val Thr Ser Ile His Ser Phe  
 1655 1660 1665  
 Ser Ser Ala Phe Leu Phe Ser Ile Glu Val Gln Val Thr Ile Gly  
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1670		1675		1680
Phe Gly	Gly Arg Met Val	Thr Glu Glu Cys Pro	Leu Ala Ile Leu	
1685		1690		1695
Ile Leu	Ile Val Gln Asn	Ile Val Gly Leu Met	Ile Asn Ala Ile	
1700		1705		1710
Met Leu	Gly Cys Ile Phe	Met Lys Thr Ala Gln	Ala His Arg Arg	
1715		1720		1725
Ala Glu	Thr Leu Ile Phe	Ser Lys His Ala Val	Ile Thr Leu Arg	
1730		1735		1740
His Gly	Arg Leu Cys Phe	Met Leu Arg Val Gly	Asp Leu Arg Lys	
1745		1750		1755
Ser Met	Ile Ile Ser Ala	Thr Ile His Met Gln	Val Val Arg Lys	
1760		1765		1770
Thr Thr	Ser Pro Glu Gly	Glu Val Val Pro Leu	His Gln Val Asp	
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Ile Pro	Met Glu Asn Gly	Val Gly Gly Asn Gly	Ile Phe Leu Val	
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Ala Pro	Leu Ile Ile Tyr	His Val Ile Asp Ser	Asn Ser Pro Leu	
1805		1810		1815
Tyr Asp	Leu Ala Pro Ser	Asp Leu His His His	Gln Asp Leu Glu	
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Ile Ile	Val Ile Leu Glu	Gly Val Val Glu Thr	Thr Gly Ile Thr	
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Thr Gln	Ala Arg Thr Ser	Tyr Leu Ala Asp Glu	Ile Leu Trp Gly	
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Gln Arg	Phe Val Pro Ile	Val Ala Glu Glu Asp	Gly Arg Tyr Ser	
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Val Asp	Tyr Ser Lys Phe	Gly Asn Thr Ile Lys	Val Pro Thr Pro	
1880		1885		1890
Leu Cys	Thr Ala Arg Gln	Leu Asp Glu Asp Arg	Ser Leu Leu Asp	
1895		1900		1905

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Ala Leu Thr Leu Ala Ser Ser Arg Gly Pro Leu Arg Lys Arg Ser  
 1910 1915 1920

Val Ala Val Ala Lys Ala Lys Pro Lys Phe Ser Ile Ser Pro Asp  
 1925 1930 1935

Ser Leu Ser  
 1940

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